System Weighing Controller

PR 1713

Installation Manual

Installation manual **9499 053 45710** Edition 3 *Dat. 20000808*

for PR1713/.. **Release: 1.10**

GLOBAL Weighing
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1 SAFETY HINTS, ELECTRICAL PROTECTION CLASS

This instrument was built and tested in accordance with the safety regulations for measuring and control instrumentation for protection class I (protective earth connection) according to IEC 1010/ EN61010 or VDE 0411. The instrument was delivered in safe condition. To maintain this condition and to ensure safe operation, the operator must follow the hints and warnings given in this documentation.

1.1 Application of the instrument

PR1713 is intended exclusively for application in weighing and batching installations and is particularly suitable for tank and hopper weighing, weighbridges, platform scales, crane weighing, batching systems and as a weight indicator in intelligent control systems. Product operation, commissioning and maintenance must be done by well trained and qualified persons who knows of the risks and avoid them, or take measures to protect themselves.

The instrument is state of the art. No warranty is taken that the product is free of errors, especially with reference to the software and hardware required for operation and supplied by third parties. The manufacturer does not take any liability for damage caused by incorrect use of this product. Using this product implies recognition of the above-mentioned regulations.

1.2 Initial inspection

Check the contents of the consignment for completeness and note whether any damage has occurred during transport. If the content is incomplete or damaged, a claim must be filed with the carrier immediately and the GWT GLOBAL Weighing sales or service organization must be informed to permit repair or replacement of the unit.

1.3 Before commissioning

Visual inspection ! Before commissioning, after storage and transport, the instrument must be inspected visually to preclude mechanical damage.

1.3.1 Installation

PR1713 has an installation bracket with holes in different distances and can be mounted adjustable between rubber disks by knurled-head screws to the detachable installation bracket. The stainless steel housing of the instrument fulfills IP65. The unit can be mounted in any position, however, the PG glands should not point upwards (water). Before commissioning the instrument, all unused instrument apertures must be closed with blind plugs. For cooling the instrument, the air circulation must not be hampered. Heat influences, e.g. direct sun radiation, must be avoided. The environmental conditions specified in the technical data must be taken into account. The unit is suitable for:

Table-top installation:	The unit stands on the detachable installation bracket.
Wall mounting:	Mount installation bracket on the wall. The unit is held by knurled-head screws.
Installation in control cabinets:	With mounting brackets, optional **mounting kit PR1713/91** can be ordered separately.

1.3.2 Electrostatically sensitive components

This instrument contains electrostatically sensitive components. Therefore, potential compensation must be provided when working at the open instrument (antistatic protection).

1.3.3 Opening the instrument

CAUTION DANGER TO LIFE !

Working at the switched on unit may be dangerous to life. Disconnect the instrument from the supply voltage! When removing covers or parts by means of tools, live parts or terminals may be exposed. Capacitors in the unit may still be charged also after disconnecting the unit from all voltage sources. When selecting a different supply voltage and when replacing the loadcell fuse, the unit must be disconnected from all voltage sources.

1.3.4 Earthening

Earthening of the unit must be via the protective earth conductor PE.

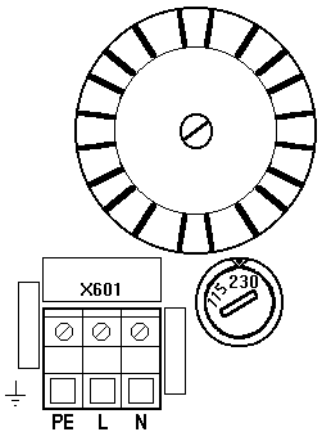
1.3.5 Protective earth

The connecting cable of the unit must comply with the regulations in accordance with VDE 0411 or EN61010. The power cable must contain a protective earth conductor, which must not be interrupted inside or outside these units (e.g. by using an extension cable without protective earth). The protective earth must be connected with **terminal PE** in the power connecting block. Before commissioning, acceptance of the installation by a technically responsible expert is required.

1.3.6 Power connection PR1713/00

The unit is designed for AC power supply: 50 Hz / 60 Hz
with supply voltage: 230 V / 115 V

The adjusted operating voltage must correspond to the nominal power voltage. Changing over from 230 V (factory setting) to 115 V is done by means of a rotary switch, which can be actuated using a screwdriver. Turn the switch to the required voltage marked below the arrow. Power connecting terminals, supply voltage selector switch and transformer are located in the housing bottom left above the row of cable glands.
Caution: The power cable conductors must be tied together with a cable strap shortly before the terminal block! As the unit has no power switch, it is ready for operation immediately after connecting the supply voltage. The firm **power connection must be protected with a fuse**.
Additionally, an interruption (safely) of both phases of the supply voltage must be possible, e.g. by means of a switch or a power connector.



1.3.6.1 Power supply PR1713/01

The device PR 1713/01 is prepared for operation with 24V AC/DC supply voltage, use mains screw L and N of terminal block: connect 24 V ~=

Changes in the operating manual for PR 1713/01:

The information about mains supply voltage is changed to 24 V AC/DC in chapters: 1.3.6, 2.1, 6.2.5.

1.4 Repair and maintenance

Repairs are subject to checking and can be carried out only in the factory at GLOBAL Weighing Technologies GmbH Hamburg. In case of defect or functional trouble, please, contact your GLOBAL Weighing Technologies organization for repair. When returning the instrument for repair, an exact and complete fault description must be supplied. Maintenance work may be carried out only by a trained technician aware of the involved hazards, whereby the relevant precautions must be taken.

1.4.1 Failure and excessive stress

If the instrument is suspected of being unsafe, shut it down and protect it against accidental operation. This is the case when the unit

- is physically damaged,
- does not function any more,
- is stressed beyond the tolerable limits (e.g. during storage, transport).

1.4.2 For special attention

Make sure that the construction of the instrument is not altered to the detriment of safety. In particular, leakage paths, air gaps (of live parts) and insulating layers must not be reduced. The conductors of each cable must be tied together with a cable strap shortly before the terminal block. The manufacturer cannot be held responsible for personnel injury or damage caused by an instrument repaired incorrectly by user or installer.

1.4.3 Fuse

The load cell supply circuit is protected by a 250 mA slow blowing fuse. The following fuse is fitted:

Wickmann order no. 19372K, TR 5 Radial, slow blowing IEC 127-3 | 250 mA T |

The fuse may be replaced only by a qualified person.

! WARNING !

Using repaired fuses and short-circuiting of the fuse holder are not permitted.
Note that only fuses of the specified type and current rating in accordance with IEC 127 may be used for replacement.

The transformer primary winding is protected by means of a thermal fuse. After overheating, the thermal fuse is molten. The PR1713 has to be sent to our service for repair. The secondary winding

is protected additionally by a Multifuse 1,85 A. If it switches off (e.g. due to low power voltage) disconnect the device from power. After a cooling down period of about 3 min. it can be used again, if the power voltage is O.K.

1.4.4 Soldering work

Soldering work is not necessary with this unit.

1.4.5 Battery replacement

This unit contain a lithium battery for memory back-up (saving the data). When exceeding the specified minimum battery voltage, or in case of defect, the battery must be replaced by the GWT customer service or by an equivalent trained person and disposed of in accordance with the local regulations.

After delivery, the battery is not connected. Battery connection is via a jumper (see "3.4.1 Activating the battery").

There are different possibilities for monitoring the battery voltage during operation. For function and adjustment of the 'LoBat' indication, see "4.5.3.3 Low Battery Check".

1.4.6 Disposal

Electronics scrap is special waste. Please, follow the instructions of your local disposal company.

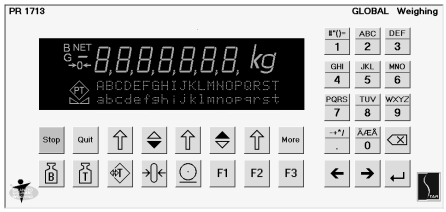
1.5 Cleaning

If necessary, the front panel can be cleaned using a damp, soft cloth. Use only little water or isopropyl alcohol for moisturizing. With the PC-AT keyboard connected, protection type IP 65 is not met any more! No moisture must enter the instrument inside.

2 SYSTEM WEIGHING CONTROLLER PR1713

PR1713 is equipped with an internal weighing point, display and keyboard for simple applications. The instrument is programmable according to the IEC 1131-3 standard (for field of application, see data sheet). With PR1750, PR1713 can be matched easily to the application (operation), recipe functions (process steps), process control (by built-in PLC). With an application program, the unit is a powerful system for control of weighing and batching processes and combines all functions such as convenient operator interface, weighing and batching controller, PLC, interfaces.

2.1 Basic instrument survey



- Accuracy 5000 d for the internal weighing point.
- Green fluorescent display for weight, 2 lines for text.
- Front panel controls, function keys.
- Stainless steel housing sealed to IP65, with EMC cable glands
- PC-AT keyboard connectable (no protection to IP65).
- Serial interface RS 232 built-in for e.g. printer, remote display, terminal or communication.
- Extensible by means of options (3 sockets), RAM-extension, 1 socket for a field bus module.
- All interfaces (except the RS 232 interfaces) are galvanically isolated.
- Built-in power connection for 230 V/ 115 V AC, protection class I (protective earth).
- All connections in the housing are made to plug-in terminal blocks (except the power cable).
- The unit is suitable for mounting in a panel cut-out, for wall mounting or as a table-top unit.

Calibration or configuration of PR1713 is menu-guided via the operator device (keys on the front panel or an additional "VT100" terminal at "Builtin" or an other RS 232 interface).

- Calibration by means of weights or by entry of the mV/V values without additional calculations.
- Configuration of the interface cards, e.g. for remote display, programs PR1740, PR1791, ...
- At external terminal an operator can check the analog/ digital converter with analog test.

Communication protocols:

Fieldbus slave (option) additional by PR1721/xx

for the Internal RS 232 or the optional RS 232/ 485
- EW protocol
- remote display (string)
- printer (string)

Extensible by means of licenses, e.g.

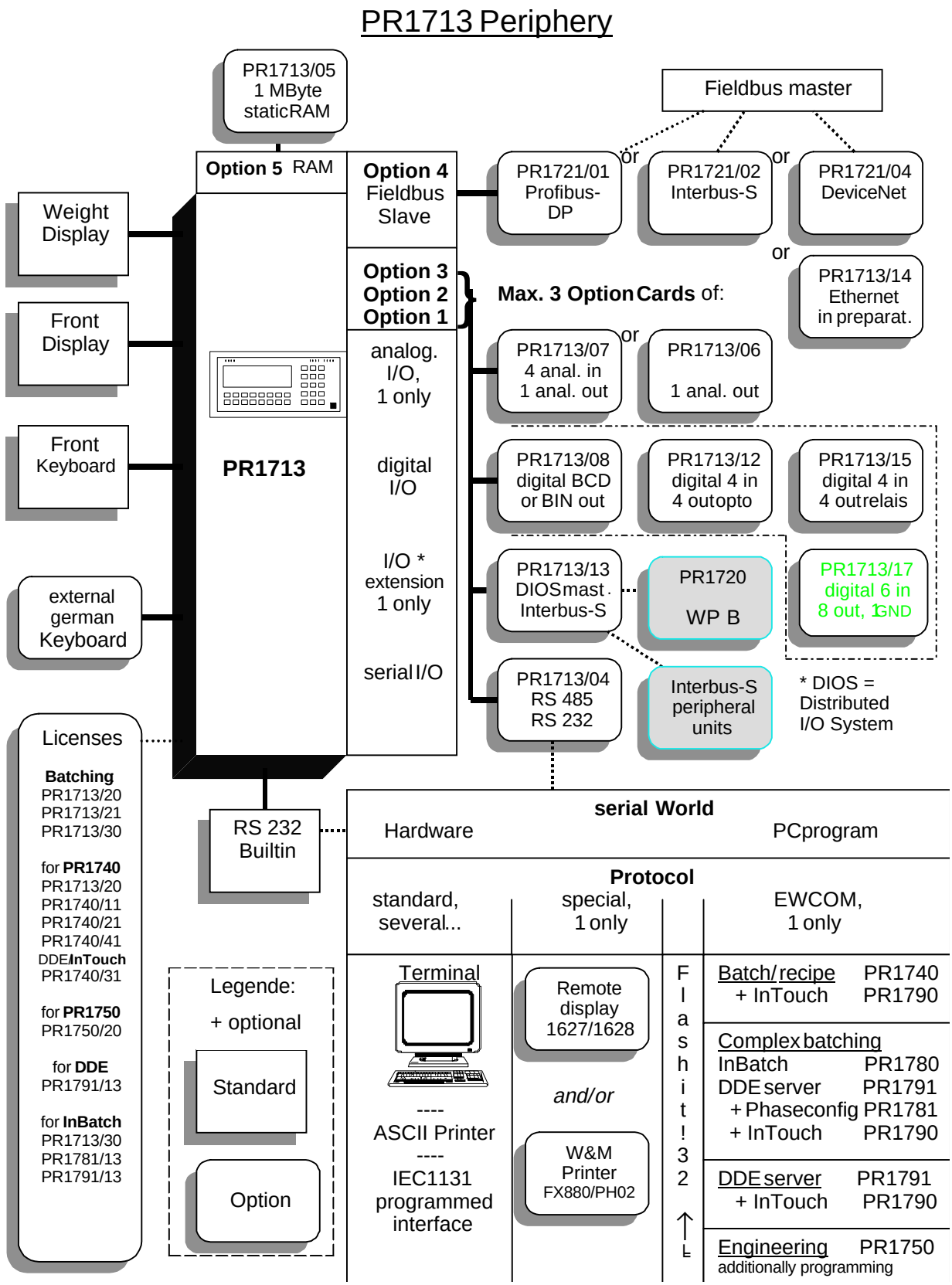
Licenses are activated via a license number, which is related with the board number of PR1713.

- PR1713/20 Batching controller, **one recipe**, max. 255 lines
- PR1713/21 Batching with **several recipes**, max. 255 lines
- Licenses for recipe manager PR1740
- License for standard batching module S 88
- License for DDE-transactions with Windows NT
- License for programming, PR1750 in connection with device

PR1750 is available on the CD "Complementary SW-TOOL-BOX", updates are available in the Internet. PR1750 can be used free-of-charge without license for:

up to 64 lines IL-code
only one task possible in the PLC resource
Operating and recipe resource not programmable

2.2 Options


PR1713 Periphery
PR1713/05
1 MByte
staticRAM
Option 5 RAM
Fieldbus master
Option 4
Fieldbus
Slave
PR1721/01
Profibus-
DP
or
PR1721/02
Interbus-S
or
PR1721/04
DeviceNet
or
PR1713/14
Ethernet
in preparat.
Option 3
Option 2
Option 1
Max. 3 Option Cards of:
Weight
Display
Front
Display
Front
Keyboard
external
german
Keyboard
PR1713
analog.
I/O,
1 only
digital
I/O
I/O *
extension
1 only
serial I/O
PR1713/07
4 anal. in
1 anal. out
or
PR1713/06
1 anal. out
PR1713/08
digital BCD
or BIN out
PR1713/12
digital 4 in
4 outopto
PR1713/15
digital 4 in
4 outrelais
PR1713/13
DIOSmast.
Interbus-S
PR1720
WP B
PR1713/17
digital 6 in
8 out, 1GND
PR1713/04
RS 485
RS 232
Interbus-S
peripheral
units
* DIOS =
Distributed
I/O System
Licenses
Batching
PR1713/20
PR1713/21
PR1713/30
for PR1740
PR1713/20
PR1740/11
PR1740/21
PR1740/41
DDE/InTouch
PR1740/31
for PR1750
PR1750/20
for DDE
PR1791/13
for InBatch
PR1713/30
PR1781/13
PR1791/13
RS 232
Builtin
serial World
Hardware
PCprogram
Protocol
standard,
several...
special,
1 only
EWCOM,
1 only
Terminal

ASCII Printer

IEC1131
programmed
interface
Remote
display
1627/1628
and/or
W&M
Printer
FX880/PH02
Flash it! 32
Batch/recipe PR1740
+ InTouch PR1790
Complex batching
InBatch PR1780
DDE server PR1791
+ Phaseconfig PR1781
+ InTouch PR1790
DDE server PR1791
+ InTouch PR1790
Engineering PR1750
additionally programming
Legende:
+ optional
Standard
Option

2.2.1 Program extensions (optional)

Product	
PR 1713/20 *)	Batching function with 1 recipe, up to 255 components, freely configurable
PR 1713/21 *)	Batching function with several recipes ≤ 255 components each, freely configurable
PR 1713/30	Standard batching phases, InBatch (< 256 I/Os)
PR 1713/81	SW: Alibi Memory (W&M)
PR 1740/11	Recipe management and component management
PR 1740/21	Production plan
PR 1740/31	DDE interface, e.g. for InTouch
PR 1740/41	Remote operation via a terminal
PR 1750/00	Programming tool on CD (OEM)
PR 1750/10	Programming tool (instrument)
PR 1781/13	Phase configurator
PR 1791/13	DDE server

For details on the programs, see the relevant program manual.
*) Additionally I/O-Cards are needed, e.g. PR1713/12 in option slot 1 und 2, PR1713/04 in option slot 3.

2.2.2 Plug-in cards and modules (optional)

On the connecting board, PR1713 can accommodate up to 3 identical or different plug-in cards.

Product	
PR1713/04 (max. 3 cards) 2 serial interfaces RS 232 and RS 485/ RS 422.	The RS 485 serial interface must be configured before installation via DIL switches on the interface card! Protocols configurable by software set-up.
PR1713/06 1 Analog output, galvanically isolated, (only 1 card)	Configuration and fine adjustment of output levels with software correction. Signal output analog 16 bits, 65000 divisions, 0/4 - 20 mA
PR1713/07 1 Analog output, 4 analog input, (only 1 card)	Output: see PR1713/06. Input: 4 channels with common ground, resolution 3000 d.
PR1713/08 BCD output	5 decades decimal or 3 byte binary (with application program)
PR1713/12 (max. 3 cards) 4 inputs and 4 outputs	Digital interfaces galvanically isolated via optocouplers. Inputs active or passive. Configurable by software set-up.
PR1713/13 DIOS master, digital I/O system for connection of PR 1720 as 2nd weighing point and as bus interface for max. 265 additional dig. I/O, (only 1 card)	Master function based on Interbus-S standard for control of digital I/O. A PR1720 can be used as a 2nd weighing point at the DIOS card. Automatic detection of the connected modules. The max. possible number of ports is limited to 256 bits or 4 modules. The card has integrated termination resistors.
PR1713/15 4 optocoupler inputs 4 relay outputs	similar to PR1713/12, but configurable relays output

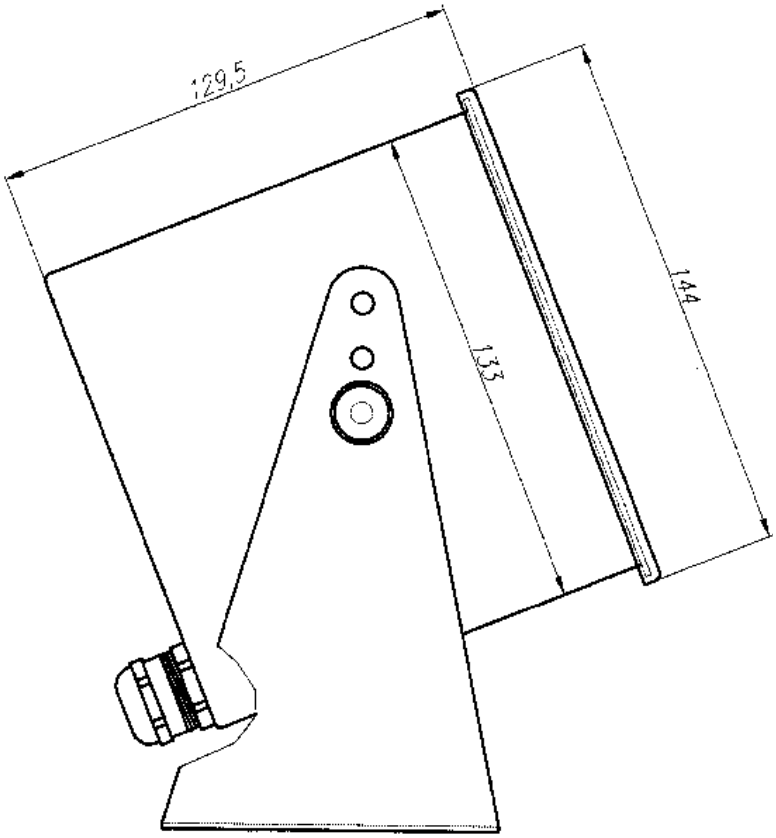
The following options can be inserted on print 2 (below the front panel):

Product	
PR1713/05 1 MB static RAM	The memory extension is detected after installation and cold start.
PR1713/14 Ethernet	in preparation
PR1721 field bus interface connecting unit max. transmission rate 1,5 Mbits	• PR 1721/01 Profibus-DP (slave) • PR 1721/02 Interbus-S (slave) • PR 1721/04 DeviceNet (slave)

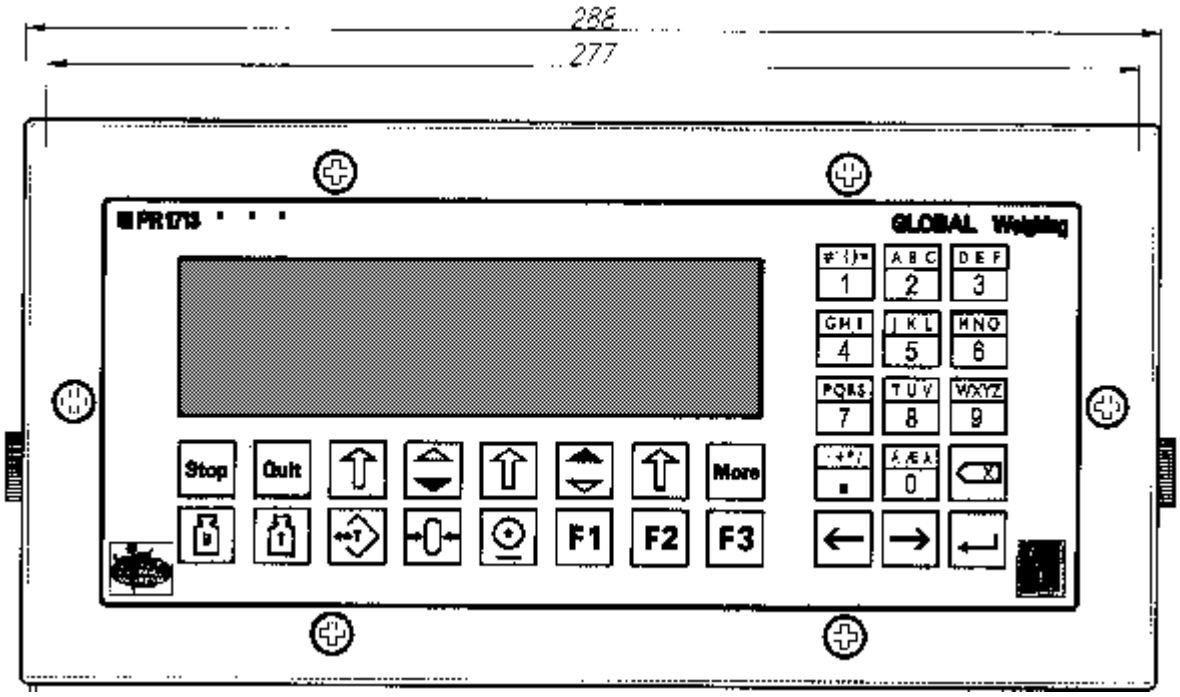
For details on the products, see the relevant chapters of this manual.

2.3 Housing

PR1713 is accommodated in a stainless steel multi-purpose housing (288x144x130 mm) of protection type IP65. It is suitable for table-top installation, wall or panel mounting. The housing can be opened forwards. Keyboard, display and main print form a unit with the front panel. The front bezel is 5 mm thick and held in position by means of 6 screws. A rectangular panel cut-out (278 mm x 134 mm) is required for front panel mounting.



The cables are entered via 9 stainless steel EMC glands on the housing rear. Unused cable glands must be shut with blind plugs (IP 65!). Power cable and external keyboard excepted, all connections are made via internal screw terminal connectors. The cable glands for power connection, LC connection and Builtin are always provided. The remaining glands are divided as follows: 2x for the field bus option 1x for each of the three options. For connection of the options, three 16-pole connector blocks with identical pin allocation (2 terminal rows each with 8 terminals) are provided. The PR1721/xx module has an 18-pole terminal row. The socket for an external PC-AT keyboard with standard round connector is accessible from the rear after removing the protecting panel.
CAUTION: with the PC-AT keyboard connected, protection type IP 65 is not met any more!



3 INSTALLING THE INSTRUMENT AND OPTIONS

Before starting any work, read section 1 "Safety hints, electrical protection class" and follow all hints! Further procedure:

- Check the consignment: unpack all parts pertaining to the project.
- Safety inspection: damages?
- Ensure that the installation is correct and complete including cables, e.g. power cable, power connection with fuse, load cells, cable junction box, data cable, console/ cabinet, etc.
- The instructions for installation of the unit (related to application, safety, ventilation, sealing, external effects) must be followed!

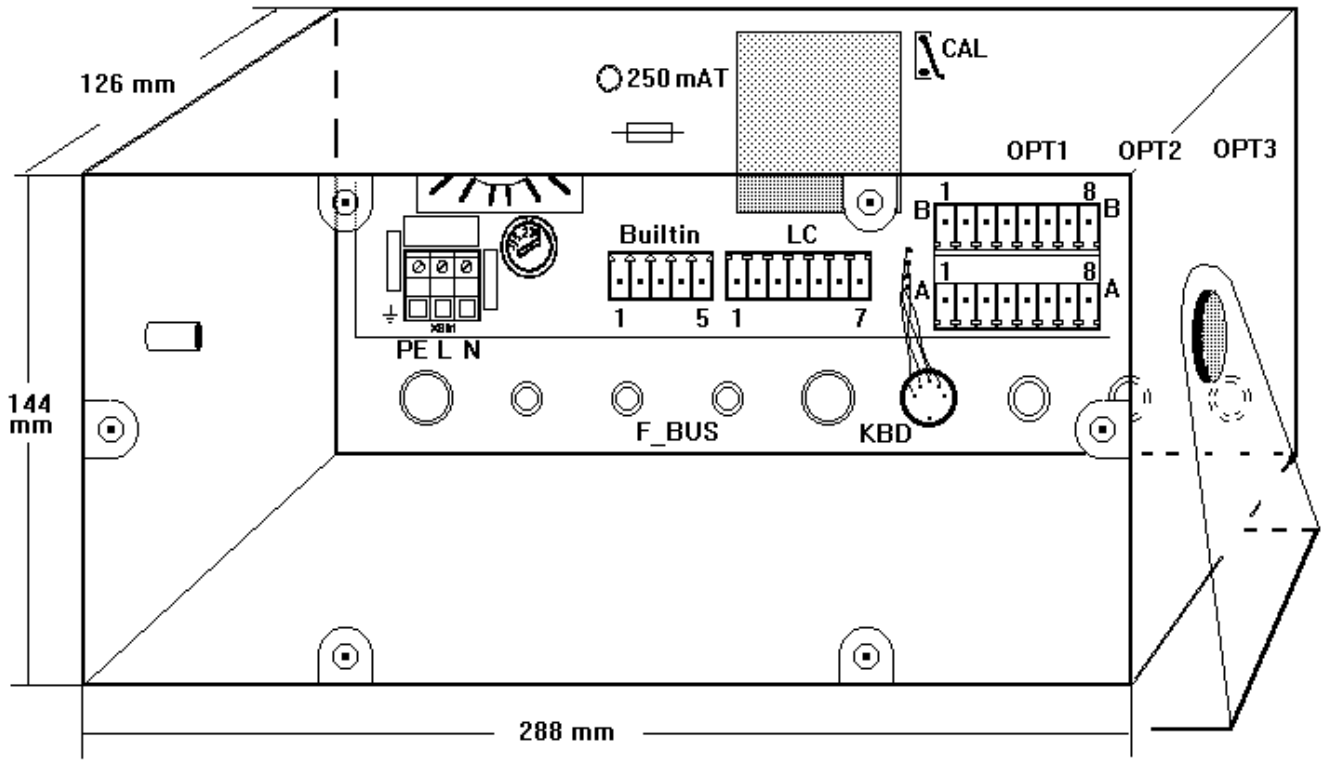
Opening the instrument

- Check the supply voltage. If necessary, turn to voltage selector into the correct position. If necessary, mount the options (plug-in cards, memory extension).
- Fit the jumper for internal battery.
- Connect the cable from the cable junction box or load cell.
- If necessary, connect further data cables.
- Connect the power cable.
- Check the installation and connect the unit.

3.1 Mechanical preparation

A table-top unit requires a flat, stable surface. With wall mounting, the installation bracket must be mounted on the wall. With cabinet or panel mounting, the housing must be provided with a cut-out. Keep all parts, technical documents and required tools at hand. Take the cable to the place of installation and mount it (e.g. by means of cable ties). Remove the insulation from the cable ends and keep the strands short.

3.2 Hardware construction



The electronics of PR1713 is accommodated on two circuit boards connected via cables. Connection of main print 2 and connecting board (print 1) in the basic housing is via two 20-core flat cables and a 4-core cable. The board accommodates the processor with its components: loaded Flash-EPROM, memory modules, interfaces and serially connected display. For mounting the field bus interface PR1721/xx, a 50-pole connector is provided. Two free DIL sockets are provided for mounting the RAM extension.

The connecting board accommodates the power supply (transformer and switching power supply) with firmly fitted power terminal, the analog part for the load cell, the detachable connectors and the three sockets for options. The standard connector for the PC-AT keyboard is connected on the circuit board with by means of 4 leads.

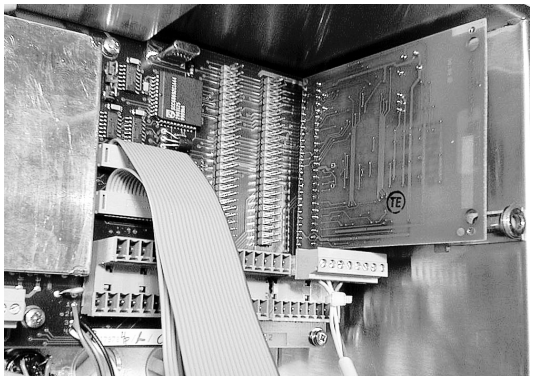
3.2.1 Installing the options

The **connecting board** is provided with three identical sockets (double row, 2*25 contacts) for options. The expression for the sockets (from left to right) is I/O-Slot 1 .... 3. The plug-in card connections are taken identically from each socket to two terminal rows. The connectors with dual terminal rows are in front of each card on the connecting board. The pin allocations are different dependent of built-in interface card. **The options are detected automatically after cold start.**

Installation: layer side left, component side right
Attention: position plug exactly above contact pins! Set both rows correctly in the holes of the plug.

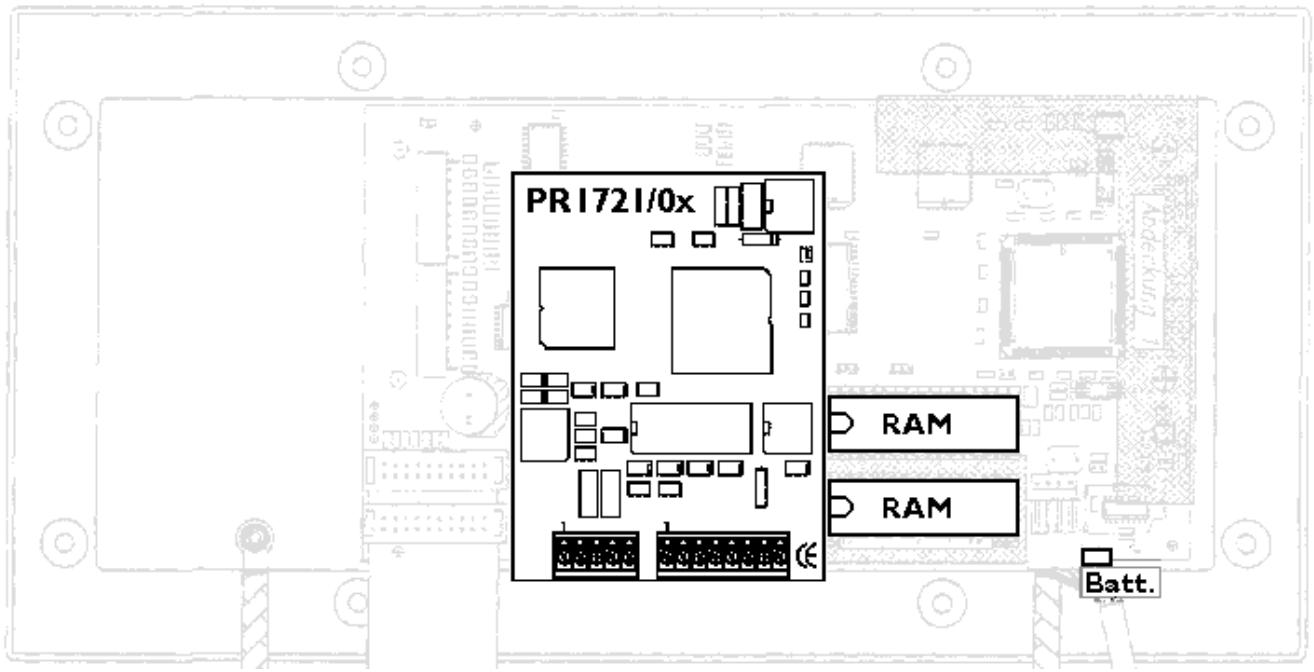
The optional plug-in cards are provided with pin markings and port addresses (list for each slot) as well as connecting examples, as far as necessary.

The terminals are described A1, A2, ... A8 and B1, B2, ... B8. Terminal row A is located at the edge of the circuit board, near the PG11 cable gland.


Option slot OPT3 and terminal B in use.

Terminal row B is above terminal row A. Avoid confusion of plugs for A, B!

The **main print** 2



Battery

Installation location for: PR1721/xx RAM
The expression for the PR1721/xx socket is I/O-Slot 4

3.2.2 Cable gland and connection

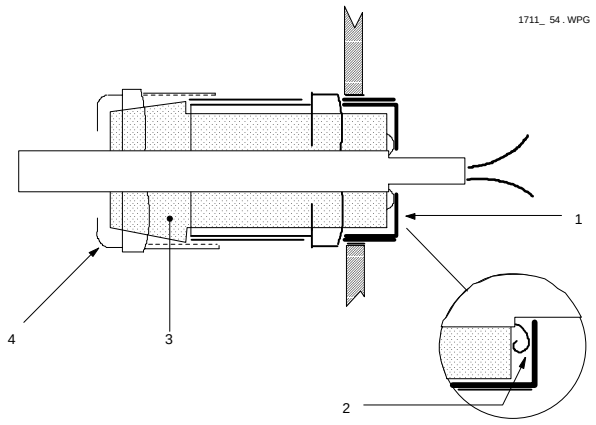
All cables are fed into the instrument via glands to ensure protection according to IP65. Cable diameters of 6...12 mm for PG13.5, 5...10 mm for PG11 and 4...8 mm for PG9 are suitable. The conductors are connected to screw terminals in the instrument. Max. conductor cross-section 2,5 mm^2.

The strip connectors are mounted on the housing bottom, above the holes for the EMC glands. The power connecting terminals excepted, all connecting terminal units are of the plug-in type. The conductors taken to the terminals shall be as short as possible. The conductors of each cable must be tied together with a cable strap shortly before the terminal block.

All cable screenings must be connected in the metal sleeves of the PG gland. Don't take the screenings into the unit!

Mounting a cable:

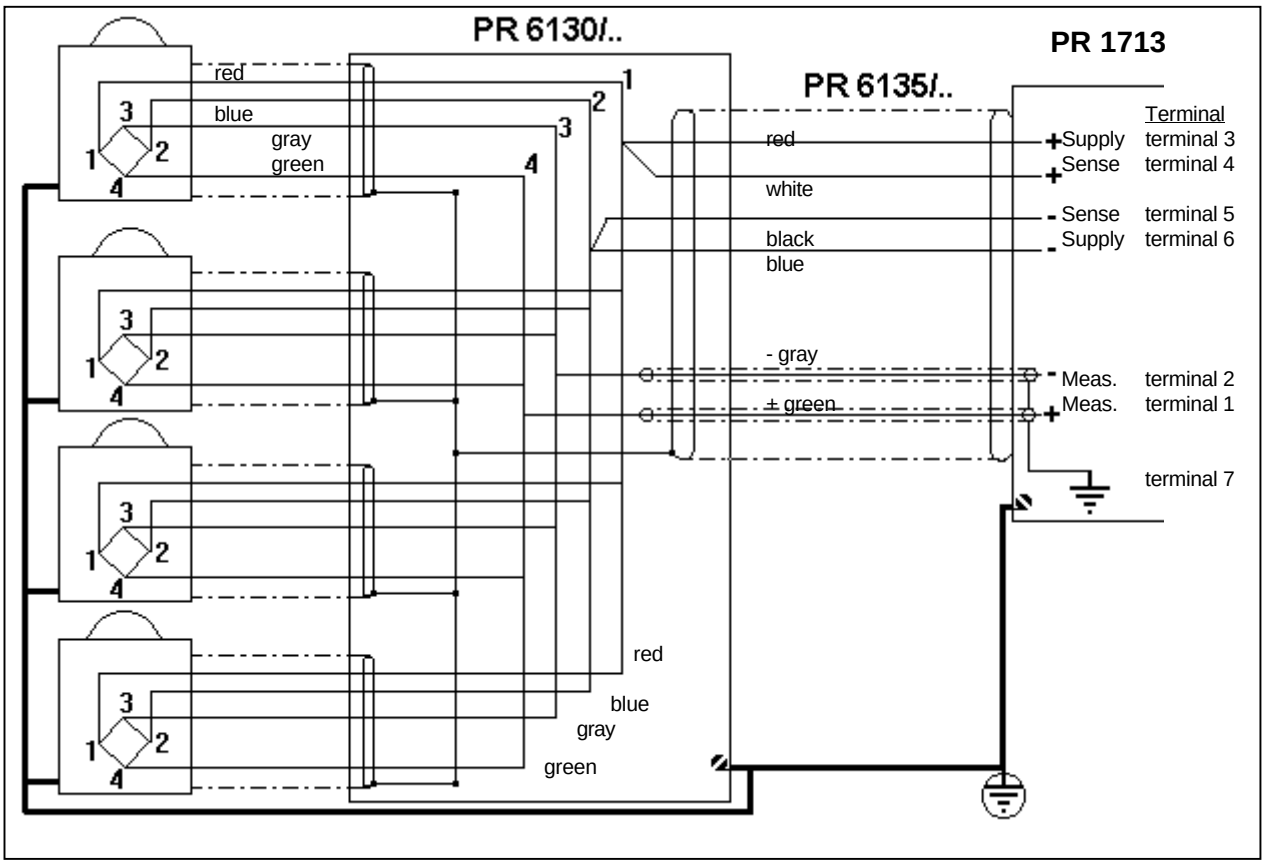
- Remove the (screw) cap.
- Slide cap and plastic cone over the cable.
- Fold the cable screening over the sleeve and the lower part of the plastic cone.
- Take the cable through the gland.
- Connect the cable conductors.
- Tighten the PG-gland.



1 Edge/recess in the PG-gland
2 The cable screening is pressed against the recess by the plastic cone.
3 Plastic cone
4 (Screw) cap

3.3 On the connecting board

3.3.1 Load cell cable/ cable junction box



Recommendation: - lay in steel tubes connected to earth potential.
- min. 1 m distance to power cables

Load cell supply circuit

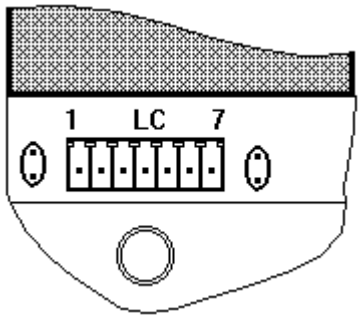
Load cell circuit resistance load ≥ 75 Ohm e.g. 8 load cells, each with 600 Ohm, firmly adjusted to 12 V, protected by a 250 mA slow blowing fuse (see 1.4.3).

Connection of one load cell in 4-wire technology:

- Provide jumpers from +6 V to +Sense and from -6 V to -Sense.

Connection of 4 (up to **8**) **load cells in 6-wire technology:**

- via cable junction box PR6130/.. with cable PR6135/..



terminal block LC	connection
1	+ U_{meas}
2	- U_{meas}
3	+ 6 V U_{ex}
4	+ U_{sense}
5	- U_{sense}
6	- 6 V U_{ex}
7	GND

3.3.2 External PC-AT keyboard

PR1713 is equipped with an alphanumeric front-panel keyboard and a connection for a german PC keyboard. Both keyboards are equivalent. They can be used alternatively and generate equal ASCII codes. Alternatively, entries from a serial terminal are possible.

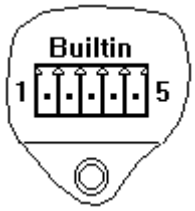
Standard connector pin allocation

1	KBD Clock
2	KBD Data
3	nc
4	GND
5	+ 5 V

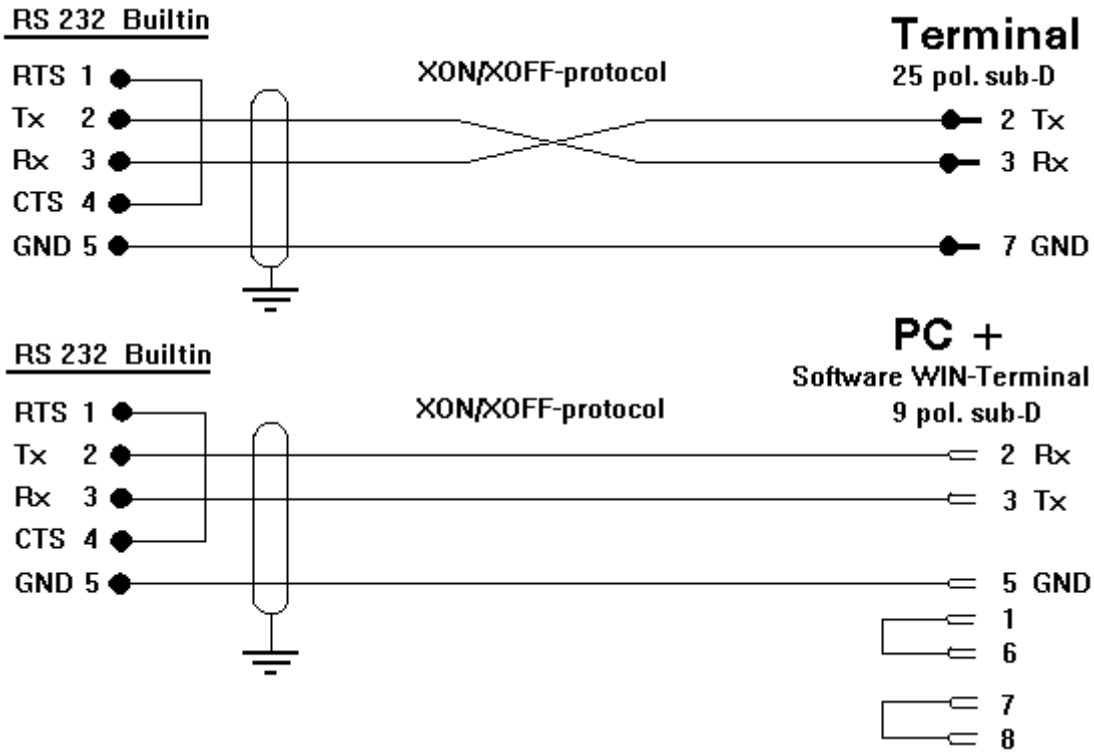
Connection for a german PC-keyboard. The LEDs of the PC-AT keyboard are not controlled. The max. permissible current consumption of the PC AT keyboard is 50 mA at 5 V. Overload is prevented by a multifuse element.

3.3.3 RS 232 Builtin interface

PR1713 is equipped with a standard RS 232 interface, which is accessible externally as Builtin from outside. When a terminal or PC with terminal program is connected, the interface can be used for calibration and configuration of the instrument. The interface can be used freely and can be configured e.g. for data transmission to a supervisory system or to a remote display. The remote display string is output continuously. If the RS 232 Builtin interface is used for configuration, wire it as shown below:



The Builtin terminal strip is located directly on the connecting board in the housing. Access to the built-in RS 232-interface is after opening the housing.

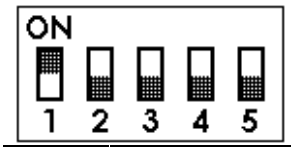


3.3.3.1 Remote display

For connection of a remote display, one of the serial RS 232 interfaces is available. The remote display PR1627 can operate with the instrument.

3.3.4 PR1713/04 Serial I/O

The plug-in card contains 1x RS 232 and 1x RS 485/ 422, whereby only the RS 485 is galvanically isolated. Max. 3 cards **PR1713/04** can be used in PR1713. The parameters of the serial RS 232 interface are adjusted by software configuration. The RS 485/ RS 422 interface for serial communication must be configured by DIL switches on the interface card before installation. The table indicates, which switches has to be closed (= ON) for a certain mode. Protocols are configurable by software set-up.



DIP switch S101,

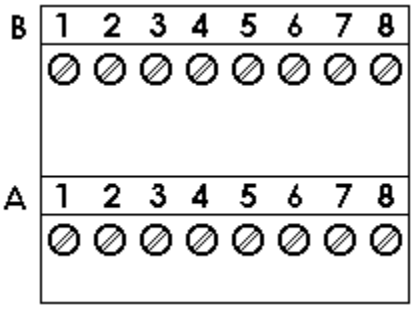
Adjustments for RS 485/ 422

S101	-1:	ON		Tristate enable (ON = RS 485, OFF = RS 422)
	-2:	ON		Rx disabled while transmitting
		OFF		Rx continuously enabled
	-3:	ON	Bus	pull-up resistor (Rx3=1k54 at +V)
	-4:	ON	termin	Bus terminator (Rx2=205E at diff. bus)
	-5:	ON	ation	pull-down resistor (Rx1=1k54 at -V)

PR1713/04	Two-wire system		Four-wire system	
	point-to-point	bus	point-to-point	bus
Master	RS 485 1;2;3;4;5	RS 485 1;2;3;4;5	RS 422 4	RS 422 3;4;5
Slave	RS 485 1;2	-	RS 422 4	-
other slaves	-	RS 485 1;2	-	RS 485 1 (default)
last slave	-	RS 485 1;2	-	RS 485 1;3;4;5

Pin allocation of connectors for options in PR1713/00 (Installation see page 10)

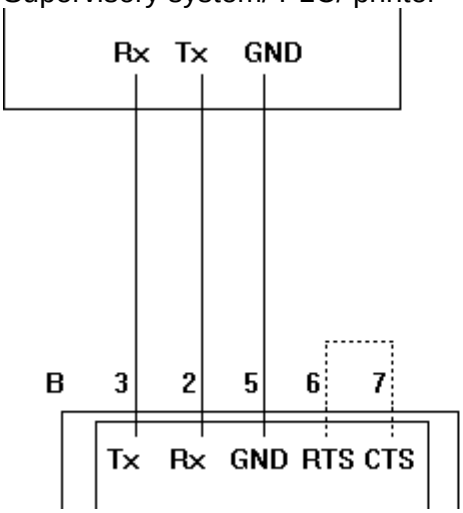
The interfaces are given logic names in the order of allocation found in the slots. The first card is detected as TTY1 and TTY2, whereby TTY1 is the RS 485 and TTY2 is the RS 232 interface. If 2 or 3 PR1713/04 cards are fitted, logic names above TTY2 do also exist (starting with OPT1, see 3.2.1).



Terminal strip B rear (top) row	RS 232	B1 DCD	B2 RXD	B3 TXD	B4 DTR	B5 Sign. GND	B6 RTS	B7 CTS	B8 RI
Terminal row A front (bottom) row	RS485/ 422 Switch ON acc. to table	A1 Sign. GND	A2 TxB	A3 TxA	A4 RxB	A5 RxA	A6 nc	A7 nc	A8 nc

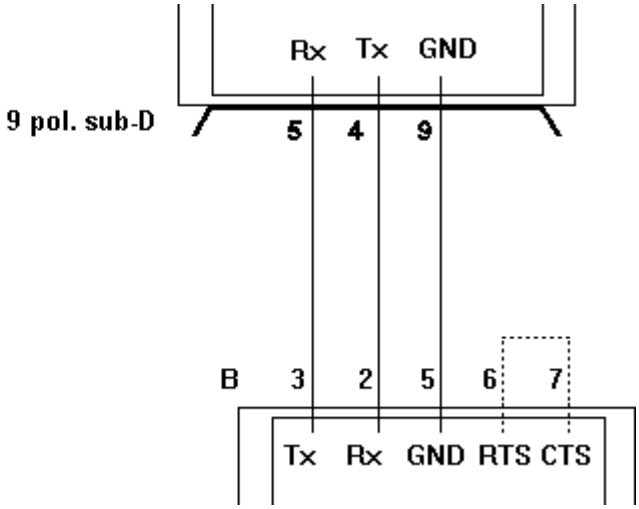
Connection to the RS 232 interface (all protocols)

Supervisory system/ PLC/ printer



PR1713/00

PR1628/00 /24 remote indicator

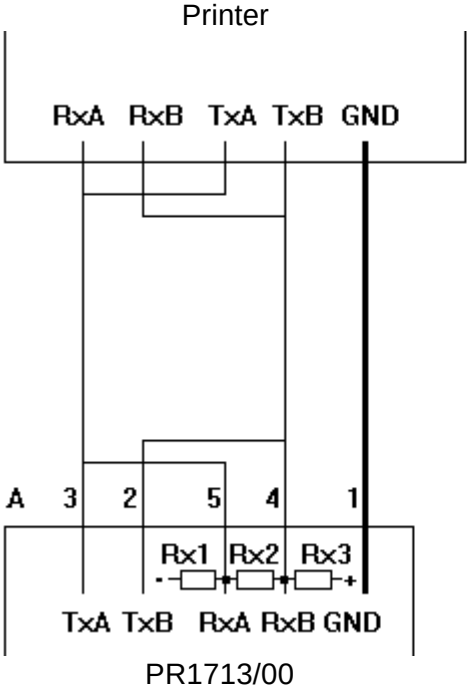


PR1713/00

With hardware handshake, connect cables with the handshake partner according to RTS-CTS.

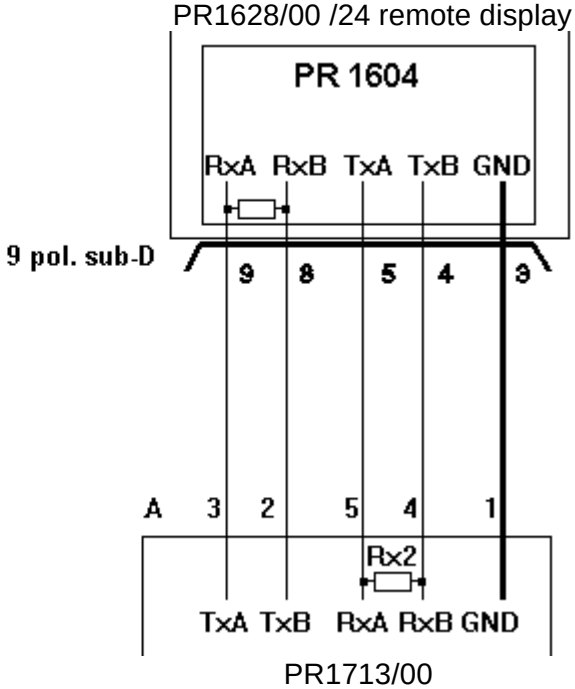
Connection to the RS 422/ 485 interface (point-to-point)

Printer



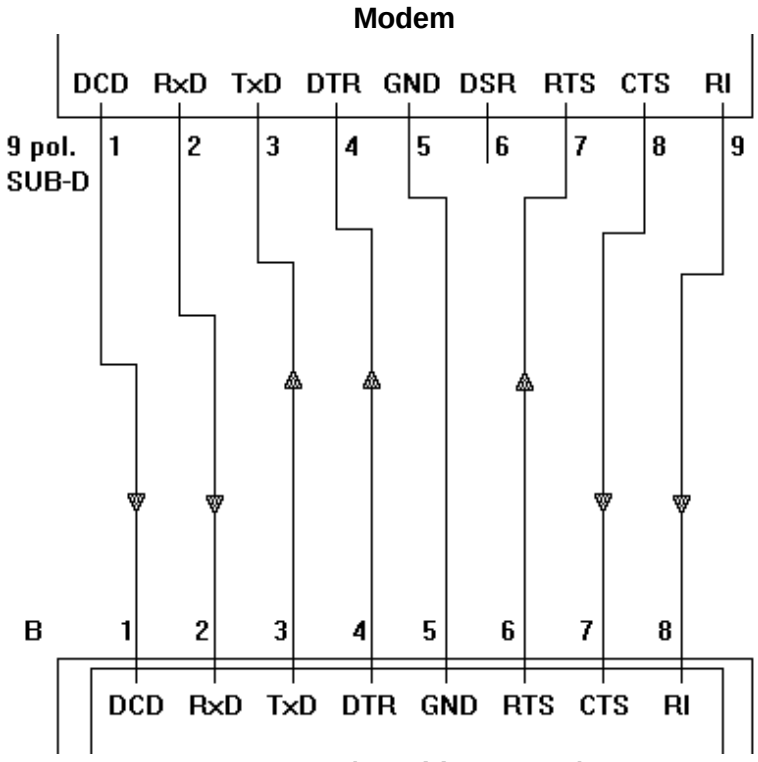
PR1713/00

PR1628/00 /24 remote display



PR1713/00

Connection of a Modem to the RS 232 interface (asynchronous protocol)



PR1713/00 with PR1713/04

course of events:

Transmitter side:
1713 induced: switch on DTR
1713 induced: switch on RTS
Modem confirmed: switch on CTS
1713 induced: send TxD

Receiver side:
Modem confirmed: DCD is ok
1713 exspects: receive RxD

In case of Hardware Handshake:

Connect lines with the opposite side (see above).
The modem is controlled by the signals of the interface PR1713/04 (see above).

In case of Software Handshake:

X-On/X-Off control has to be enabled, the Lines RxD, TxD and GND are connected 1 : 1. Provide links on both sides between RTS-CTS and DCD-DTR-DSR or link RTS-CTS-DSR. With this operation mode the modem answers automatically with a 'OK' after a command 'at'. Now you can start to set the parameters with a terminal.

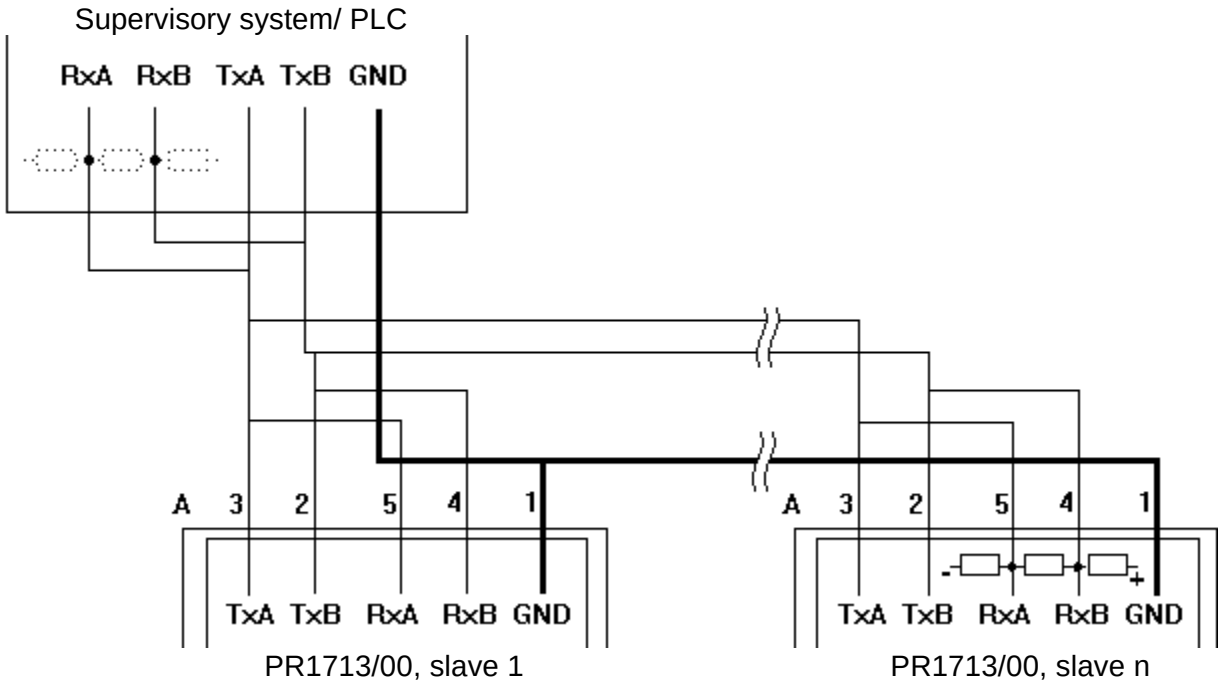
a) *auto answer = on*
This parameter is stored in register 's0' of the modem. The command is **ats0=1**.

b) *DCD = on*
Data carrier detect is always on. Command is **at&c0**.

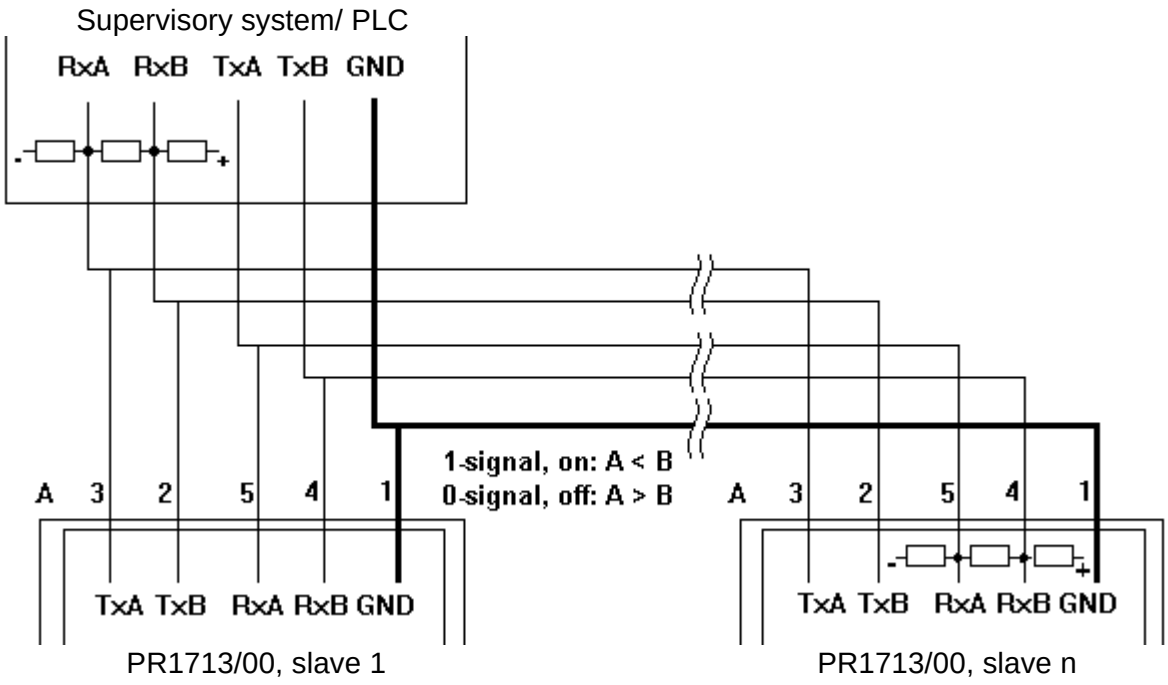
c) *hang up on DTR off*
Modem assumes command state when DTR goes on to off. The command is **at&d1**. Other modems than Elsa Microlink 33.6TQV may require **at&d2** (hang up if DTR goes to off). If this parameter is wrong, the auto answer function is not working or the modem will not hang up.

In case of problems consult the manual of the modem to find out the right commands!

Connection to an RS 485 bus (two-wire system)


Supervisory system/ PLC
RxA RxB TxA TxB GND
A 3 2 5 4 1
TxA TxB RxA RxB GND
PR1713/00, slave 1
A 3 2 5 4 1
TxA TxB RxA RxB GND
PR1713/00, slave n

Connection to an RS 485 bus (four-wire system)


Supervisory system/ PLC
RxA RxB TxA TxB GND
1-signal, on: A < B
0-signal, off: A > B
A 3 2 5 4 1
TxA TxB RxA RxB GND
PR1713/00, slave 1
A 3 2 5 4 1
TxA TxB RxA RxB GND
PR1713/00, slave n

3.3.5 PR1713/06 analog output card

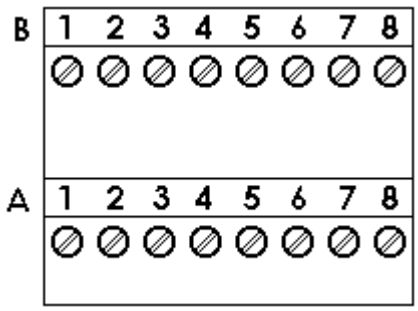
PR1713 can work with only 1 **analog output** (power consumption). The galvanically isolated connections of the analog plug-in card offer:

- 1 signal output analog 16 bits, 0/4...20 mA.
  - The analog output is configured for gross weight.

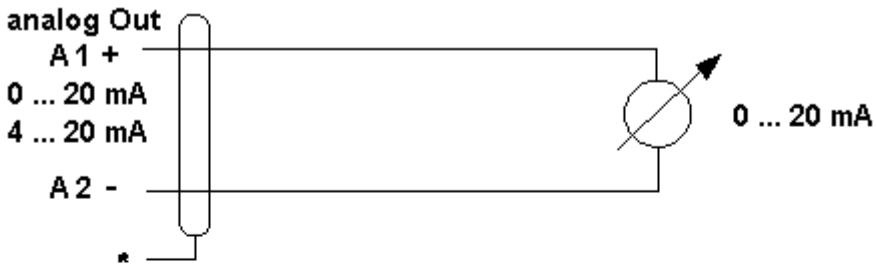
No set-up in configuration mode is necessary. After coldstart, the card is detected and the output is configured to 0/4...20 mA (gross weight).

Pin allocation of options connectors in the PR1713/00 unit (Installation see page 10)

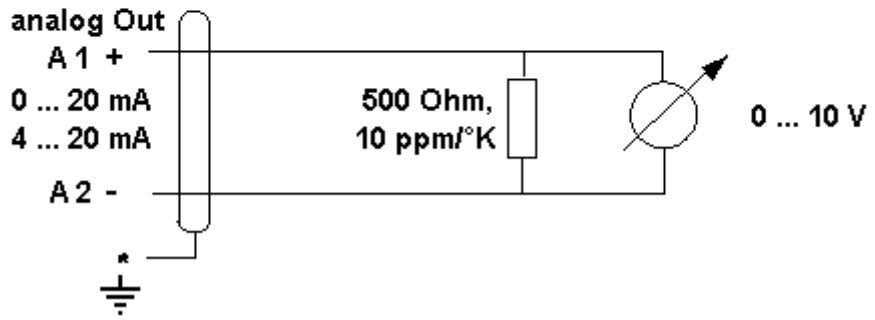
Address analog card: The
%QWn.0 address
n=1 OPT1 depends
n=2 OPT2 from OPT-
n=3 OPT3 socket
Write data as (see 3.2.1).
WORD
0 -> 0 mA
20000 -> 20 mA



Terminal row B rear (upper) row	free	B1 nc	B2 nc	B3 nc	B4 nc	B5 nc	B6 nc	B7 nc	B8 nc
Terminal row A front (bottom) row	analog output	A1 I + out	A2 I - GND (ext.)	A3 nc	A4 nc	A5 nc	A6 nc	A7 nc	A8 nc



Analog signal,
current output.
The current is
supplied directly from
the terminals.



Analog signal,
voltage signal.
The voltage level corresponds to
the voltage drop at the 500 Ohm
resistor.

3.3.6 PR 1713/07 Analog I/O

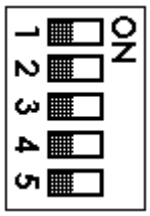
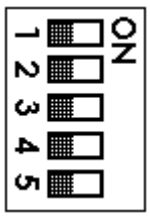
PR1713 supports only 1 **analog output** (power consumption). The card (installation see page 10) has 1 output like PR1713/06 and 4 analogue inputs. After coldstart, no set-up in configuration mode is necessary. The output is configured to 0/4...20 mA (gross weight). The analogue input with 4 channels is not supported by the standard software. It can only be used in connection with:

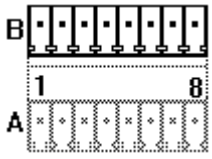
- a PR1713 internal IEC1131 program (see Programming manual), or
- the SW-option OBW (in preparation: On-Board Weighing application, special manual).

The **analog output** is identical with the output of **PR1713/06** (see preceding page). Additionally the terminals A7, A8 are prepared for use in special application (OBW).

The **analog input** has **4 channels** with common ground, **no galvanic isolation** between internal and external electronics. Function / **Technical Data**:

Sampling rate	corresponds to PLC cycle for analogue input signals
Resolution	3000 divisions in measuring range
Over range limiting	With an input value outside of the converter range the output is 8FFF(Hex) for values above and 8000(Hex) for values below the measuring range.
Total Accuracy	< 0.2 %
Temperature rate	influence < 50 ppm/K

Analogue input for Selection by switch	Input channel	**Current 0...+ 20mA**	**Voltage 0...+ 10V DC**	**Voltage 0...+ 5V DC** direct input
		Setting of switches:		
 **S201**	CH1	ON	OFF	OFF
	CH2	ON	OFF	OFF
	CH3	ON	OFF	OFF
	CH4	ON	OFF	OFF
	+ 250 Ω	----	----	----
 **S202**	CH1	OFF	ON	OFF
	CH2	OFF	ON	OFF
	CH3	OFF	ON	OFF
	CH4	OFF	ON	OFF
	+ 50 kΩ	----	----	----
Input impedance		250 Ohm	100 kOhm	> 10 MΩ, Note: set both switches ON for an unused channel

Addresses for analog inputs: **%IW n.k** with n=1..3 for OPT1..3, k=0...3 for channel 1...4 Read data as WORD.	The address depends from OPT-socket (see 3.2.1).								
Terminal row B rear (upper) row	input 4 channels	B1 + CH1	B2 - CH1	B3 + CH2	B4 - CH2	B5 + CH3	B6 - CH3	B7 + CH4	B8 - CH4

Connection of **analog output:**

Terminal row A front (bottom) row	analog output	A1 I + out	A2 I - GND (ext.)	A3 nc	A4 nc	A5 nc	A6 nc	A7 special (OBW-applic)	A8 special (OBW-applic)

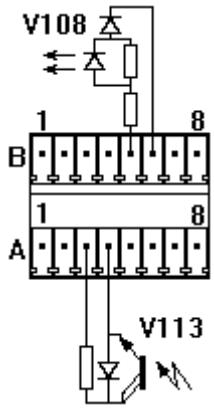
3.3.7 Control I/O: PR1713/12 Opto-, PR1713/15 Relay-Output

Max. 3 cards **PR1713/12** or **PR1713/15** can be used in PR1713. With the standard software the cards are supported in option slot 1 and 2 (OPT1, OPT2). The digital interfaces are passive (external supply is necessary) and have no common potential.

- 4x outputs, dig. (On -Off) OUT for process control, galvanically isolated
  PR1713/12 with passive optocoupler outputs (open collector, max. 25 mA)
- 4x inputs, dig. (On -Off) IN for process control.

The input is galvanically isolated via optocoupler. From Firmware Rel. 1.02 upwards the input signal of the digital interface is a logical "0" with open input lines.

Accessories/ options: external supply required

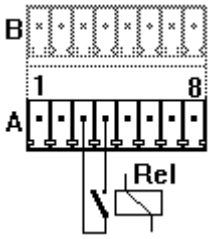


Digital input

The signal lead must supply sufficient current (see technical data). With 24 V at the terminals, the max. current flow can be 8 mA, and 4 mA with 12 V. No logic level is defined for terminal voltages within 10 V and 5 V. From 0-5 V, the input is open. Take care that the polarity is correct and that the limit values are not exceeded. A supervisory system can read the status of these inputs.

Digital output

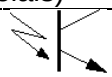
Each output of **PR1713/12** is switched via an NPN transistor. Relays should have interference suppression or a protective diode (connected in parallel with the coil, in blocking direction) with direct current!



The permissible output rating is for: PR1713/12

max. switching voltage	32 V
max. switching current	25 mA
Voltage drop at 25 mA	3 V (typical)

Each output of **PR1713/15** (see next page) is switched via a relay contact.

Pin allocation of options connectors in the PR1713/00 unit Installation see page 10.				Addresses, sockets see 3.2 OPT1	OPT2	OPT3
Terminal row B rear (upper) row	Digital input	B1 A				
		B2 K		%IX1.0	%IX2.0	%IX3.0
		B3 A				
		B4 K		%IX1.1	%IX2.1	%IX3.1
		B5 A				
		B6 K		%IX1.2	%IX2.2	%IX3.2
		B7 A				
		B8 K		%IX1.3	%IX2.3	%IX3.3
for **PR1713/12** (transistor) and for **PR1713/15** (relais)						
Terminal row A front (bottom) row	Digital output	A1 C		%QX1.0	%QX2.0	%QX3.0
		A2 E				
		A3 C		%QX1.1	%QX2.1	%QX3.1
		A4 E	or			
		A5 C		%QX1.2	%QX2.2	%QX3.2
		A6 E				
		A7 C		%QX1.3	%QX2.3	%QX3.3
		A8 E				

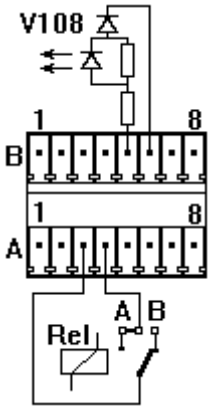
3.3.7.1 Control I/O: PR1713/15 Relay-Output

Max. 3 cards **PR1713/12** or **PR1713/15** can be used in PR1713. With the standard software the cards are supported in option slot 1 and 2 (OPT1, OPT2). The digital interfaces are passive (external supply is necessary) and have no common potential.

- 4x outputs, dig. (On -Off) OUT for process control, galvanically isolated
  PR1713/15 relay output (low voltage current), not for explosion-hazarded areas zone 2
- 4x inputs, dig. (On -Off) IN for process control.

The input is galvanically isolated via optocoupler. From Firmware Rel. 1.02 upwards the input signal of the digital interface is a logical "0" with open input lines.

Accessories/ options: external supply required



Digital input

The signal lead must supply sufficient current (see technical data). With 24 V at the terminals, the max. current flow can be 8 mA, and 4 mA with 12 V. No logic level is defined for terminal voltages within 10 V and 5 V. From 0-5 V, the input is open. Take care that the polarity is correct and that the limit values are not exceeded. A supervisory system can read the status of these inputs.

Digital output

Each output of **PR1713/15** is switched via a relay contact. The Contact is configurable by means of solder links and is delivered as closing contact.

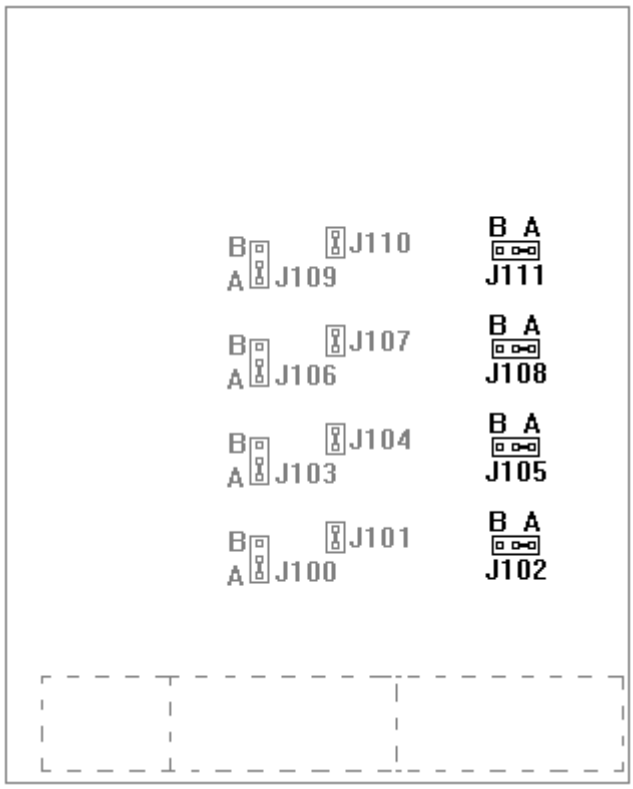
The permissible output rating is for: PR1713/15

max. switching voltage	32 V
max. switching current	1 A

The jumper J102, J105, J108, J111 are set to A upon delivery (closing contact).

To change to an 'opening contact' open A and close B by soldering.

The jumper J100, J101, J103, J104, J106, J107, J109, J110 are intended for special assembly and may not be altered.



Pin allocation of options connectors in the PR1713/00 unit: see previous page

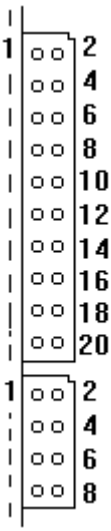
3.3.8 PR1713/08 BCD output

This option card for PR1713 is preferably used in the slot 3 on right side (installation see page 10), because otherwise plugs for other cards are blocked. The card can be used only in connection with an application program, written in IEC1131. Binary data needs to be decoded by the application program for a BCD output. The weight values (gross, net, tare) are stored in binary form in the SPM.

- Accessory 28 pole connection cable with plugs 20 pole and 8 pole at one side

Plug and connection cable (Output bit: Q, decade, bit value):

pin	bit	color	pin	bit	color
1	Q01	Sw	2	Q02	Br
3	Q04	Rt	4	Q08	Or
5	Q11	Ge	6	Q12	Gn
7	Q14	Bl	8	Q18	Vio
9	Q21	Gr	10	Q22	Ws
11	Q24	Ws-sw	12	Q28	Ws-br
13	Q31	Ws-rt	14	Q32	Ws-or
15	Q34	Ws-ge	16	Q38	Ws-gn
17	Q41	Ws-bl	18	Q42	Ws-vio
19	Q44	Ws-gr	20	Q48	Br-sw
1	Q51	Br-rt	2	Q52	Br-or
3	Q54	Br-ge	4	Q58	Br-gn
5	Enab.	Br-bl	6	**Uext**	Br-vio
7	**GND**	Br-gr	8	⏚	Br-ws



Color table	
Sw	black
Br	bruin
Rt	red
Or	orange
Ge	yellow
Gn	green
Bl	blue
Vio	violet
Gr	gray
Ws	white

Voltage supply for the output transistors 6 - **Uext**, ground potential 7 - **GND**

Earth/ cabinet: 8 ⏚ Attention: avoid earth loops to GND!

If PR1713/08 is used as BCD-output for weight values, the output bits of the 5th decade can be used as follows:

Q51	SIGN	sign bit
Q52	STSTI	standstill bit
Q54	ERROR	error bit
Q58	DAHOL	data valid

Output: Each output line of the module PR1713/08 works with common external voltage supply as reference potential and an open Emitter output. A passive output has a high impedance. An active output supplies a voltage, which is e.g. 1,7 V lower than the supply voltage. The load is between the output and GND. A module with open collector output can be built on request, the load then is between the output and the supply voltage.

- supply voltage external voltage Uext. + 5 V ... + 24 V (max. + 32 V)
- voltage drop 1,4 V at 50 mA in the switching transistor + 0.3 V in protection diode
- output cycle coupled to measuring time or per program, may be controlled external
- output lines 24 (Emitter of switching transistor, Load connected to GND, I_{max} 50 mA)
- output size 3 Byte, depending from application program, example:

	Binary	BCD
output = 7:	0 1 1 1 Q08 Q04 Q02 Q01	0 1 1 1 Q08 Q04 Q02 Q01
highest digit	1 1 1 1 F = dec. value 15 Q.8 Q.4 Q.2 Q.1	1 0 0 1 dec. value 9 Q.8 Q.4 Q.2 Q.1
highest number	F F F F F F Q58 ..... Q01	9 9 9 9 9 9 Q58 ..... Q01

Plug X104 supplies the data bits Q01 to Q48 in 5 decades with 20 wires, plug X105 supplies the highest data bits Q51 to Q58, reference potential and the input.

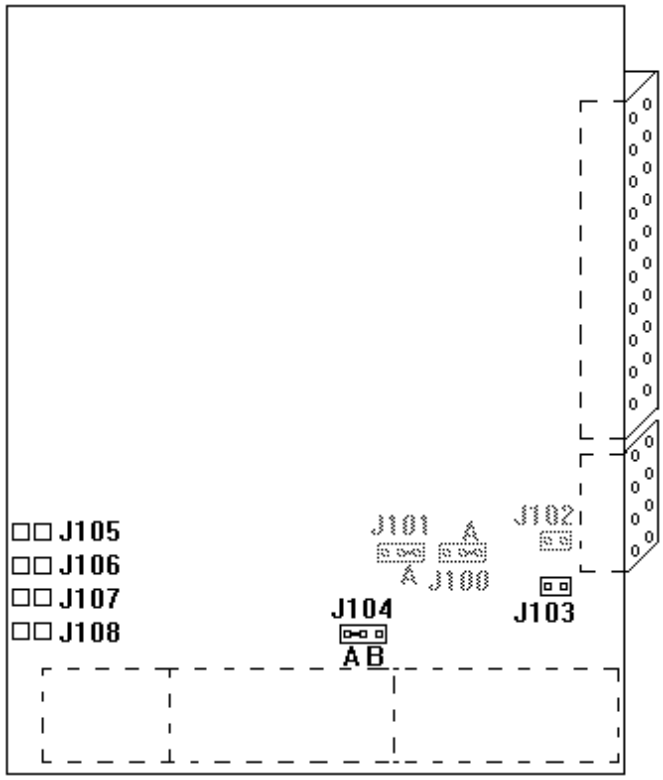
Input:

An input is provided to control all 24 output bits. To enable or disable (high-resistive) the output the input signal is fed to pin 5 - Enab. of the 8 pole plug. On delivery the input of the module is configured to work with 5 V logic active high. A positive Enab. signal enables the output permanently, with open or grounded input the output is controlled by the application program.

By solder pads J103 and J104 the logic level is defined, with an open J105 the input is disabled.

Solder pads J100, J101 and J102 are factory set for the output type and may not be changed.

The enable signal DEEXT and the setting of solder pads J106, J107 and J108*) can be detected by software. This requires to develop a special application program in IEC 1131.



	J103	J104 A	J104 B	mode	logic level for data enable	I input
5 V mode	**c**	**c**	**o**	5V/TTL	> 3.1 V	0,5 mA
5 V mode	c	o	c	5V/TTL	< 1.5 V	0,3 mA
24 V mode	o	c	o	24 V	> 16 V	1,0 mA
24 V mode	o	o	c	24 V	< 10 V	0,5 mA

o = open, c = closed

Programming the card (Slot number n = 1...3 for OPT1...3):

- Writing to output: **%QBn.0**

lower byte 3.0	Q18	Q14	Q12	Q11	Q08	Q04	Q02	Q01
	%QBn.1							
middle byte 3.1	Q38	Q34	Q32	Q31	Q28	Q24	Q22	Q21
	%QBn.2							
upper byte 3.2	Q58	Q54	Q52	Q51	Q48	Q44	Q42	Q41

If the addressing is made as WORD or DoubleWord, the highest byte Q6+Q7 is invalid:

output bytes	Q7	Q6	Q5x	Q4x	Q3x	Q2x	Q1x	Q0x
Writing bytes	x	x	2		1		0	
Writing WORD	1				0			
Writing DoubleWord	0							

- Reading inputs: **%IBn.0**

byte 3.0	0	0	1	1	J108*)	J107	J106	DEEXT

*) reserved for detecting of the output type of card
DEEXT is the transferred Enab. signal, defined by J103/J104-table setting. With open J105, Enab. can be used for any purpose.

3.3.9 PR1713/13 DIOS master

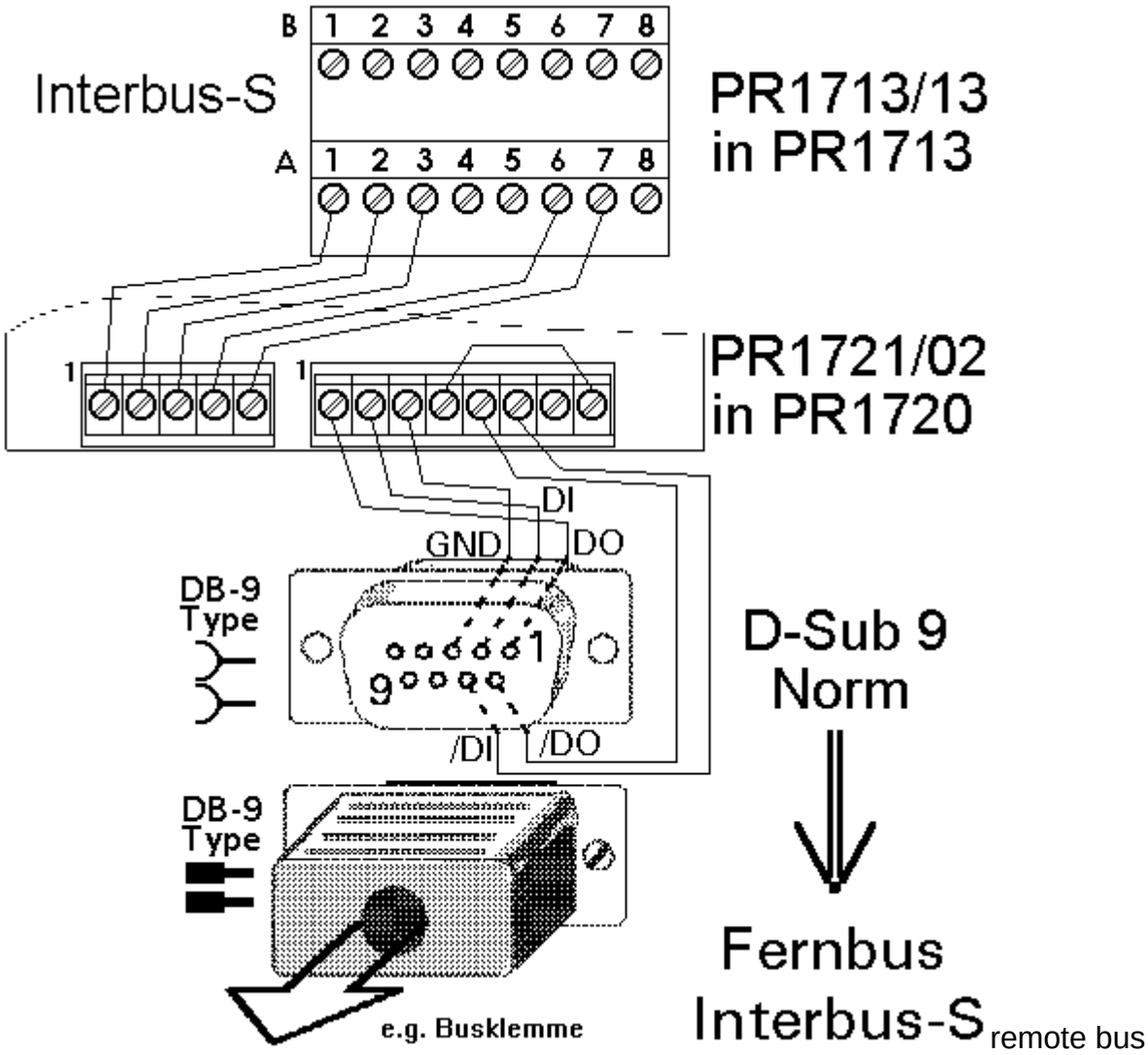
Only 1 card **PR1713/13** can be used in PR1713. The DIOS card (digital I/O system as a simple Interbus-S master) is the connecting module for external I/O extension. The maximum possible number of ports is limited to 256 bits or 16 modules at the remote bus. Only one Interbus-S master in the system is possible! Interbus-S is intended for process data input and output. The card has galvanically isolated connections and integrated termination resistors. No jumper 5-9 is fitted (master).

The DIOS master offers:

- a bus interface for max. 256 additional dig. I/O.
- automatic detection of connected modules.
- connection of PR 1720 as 2nd weighing point.

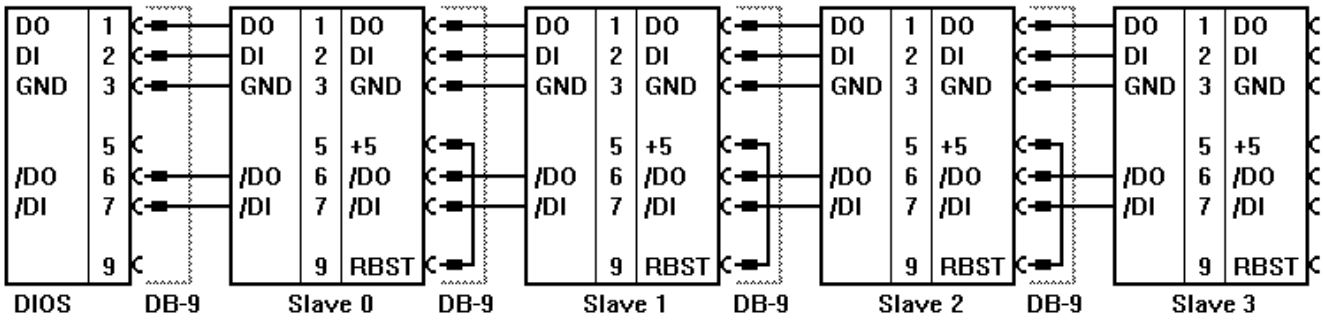
Pin allocation of options connectors in the PR1713/00 unit (installation see page 10)

Terminal row B rear (upper row)	free	B1 nc	B2 nc	B3 nc	B4 nc	B5 nc	B6 nc	B7 nc	B8 nc
Terminal row A front (bottom) row	Interbus-S	A1 DO	A2 DI	A3 GND (ext.)	A4 nc	A5 nc	A6 /DO	A7 /DI	A8 nc



3.3.9.1 Units connected to the remote bus

PR 1713/13 + 4 remote bus devices

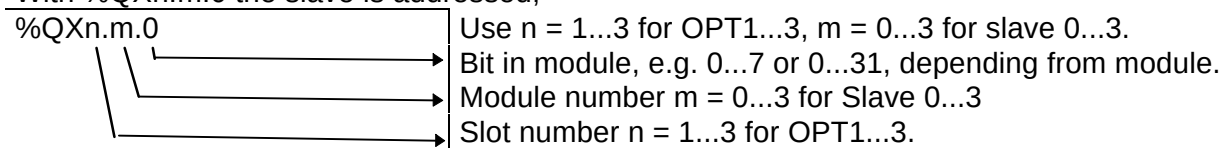


Modules with 1-8 byte can be handled. Please, note the limitation to 256 I/O (resp. 32 bytes). For e.g. PR1720, 8 bytes are required, i.e. 192 I/O are still available in this case. A bus terminal (with local bus) is also a slave. Via jumper 5-9 at the output of a slave module, the master is informed that further modules in the bus will follow. With pre-fabricated Interbus cables (twisted pair), jumper 5-9 is integrated in the cable connector. When withdrawing the connector, the master is informed automatically that the bus has become shorter.

Interbus S actuation

%IB n.0 = 00 Byte#16#00 no new input data
= 80 Byte#16#80 no input because bus error. PLC should test this byte.
= 01 Byte#16#01 new input data
%IB n.1 = 00 Byte#16#00 output has not been transferred
= 01 Byte#16#01 output has been transferred
= 80 Byte#16#80 no output because bus error. PLC should test this byte.
%IB n.3 = Diagnosis bit-Register
%IX n.24 = Ready : Bus-Module is O.K. and running
%IX n.25 = Fail : Bus-Module has failure
%IX n.26 = Run : Interbus-S is in normal active state
%IB n.4 = Module Count
%IB n.5 = (internal parameter)

With %QXn.m.0 the slave is addressed,


%QXn.m.0
Use n = 1...3 for OPT1...3, m = 0...3 for slave 0...3.
Bit in module, e.g. 0...7 or 0...31, depending from module.
Module number m = 0...3 for Slave 0...3
Slot number n = 1...3 for OPT1...3.

Note: PR1750 Rel 1.60 SP1 or newer required for DIOS. Interbus-S ST-Modules are supported.

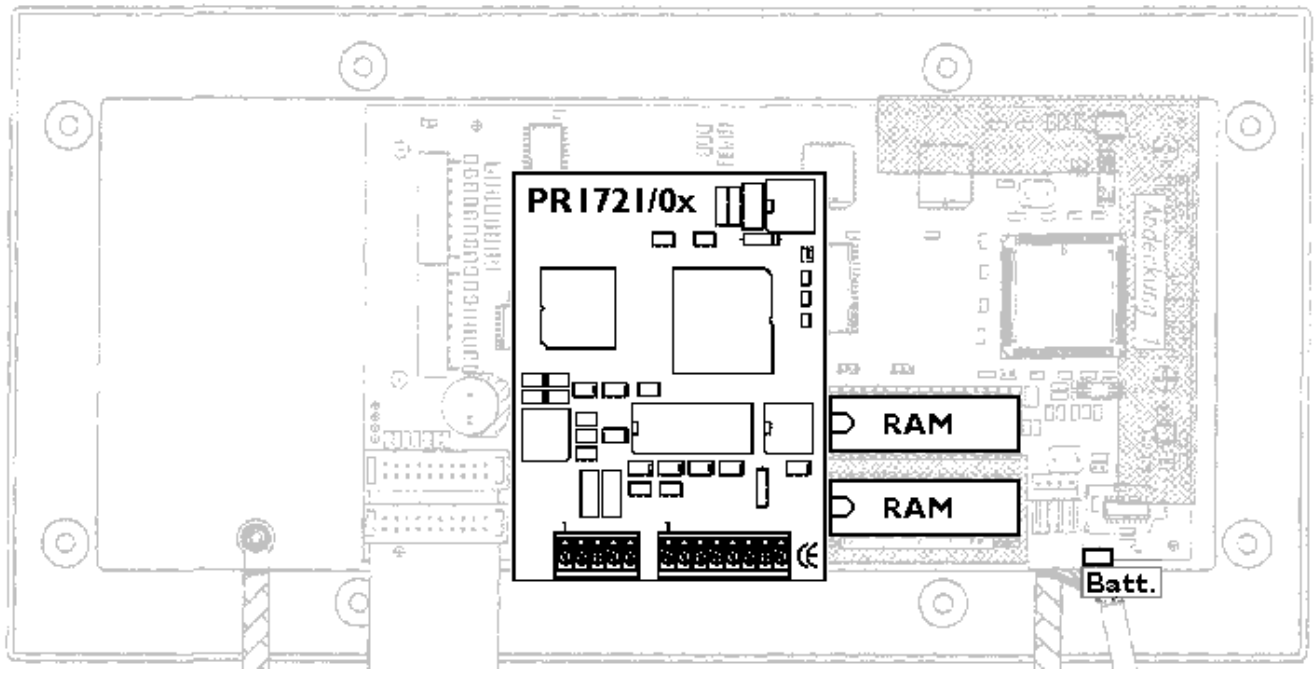
Limitation for Interbus-S master with 8-bit-modules

The Interbus-S-master PR1713/13 is not able to hand modules with odd multiples of 8 bit size. The modules must have a size of 16, 24, 32, ... bits. 32 and 64 bit modules must be aligned to multiples of 32 bit. Means the consecutive number of modules with a width of 16 must be even (if they are placed between 32 or 64 bit modules).

3.3.10 PR1713/14 Ethernet

Ethernet - in preparation. With SW-release 1.12 Ethernet is supported. The card is plugged in slot 4, the connector for fieldbus cards.
(installation see page 28)

3.4 On main print 2



3.4.1 Activating the battery

The unit is delivered with the battery not connected. The battery must be connected, follow the safety hints. The jumper for the battery is located on printed circuit board 2 beside the connector with the 4-pole power supply cable. The jumper must provide the connection between the posts to activate the battery. After the battery was activated the clock (data and time) needs adjustment.

3.4.2 PR1713/05 RAM-extension

If higher RAM storage capacity is required (e.g. for Alibi Memory PR1713/81), two optional DIL-Ram's of 512k8 capacity can be fitted. The 2 empty sockets for the memory extension are located on print 2 beside the connector with the 4-pole power supply cable. When inserting, take care to orient the components correctly. The marking in the housing and the marking in the socket must be located on the same side.

3.4.3 PR 1721 field bus interface

The Fieldbus interface PR 1721/.. is an option for installation in PR1713/00 or PR 1713/01.
Communication protocols and syntax comply with the relevant bus standard.
The communication with the Fieldbus interface is described in the book 9499 050 44210
Fieldbus card PR1721/xx Software interface manual

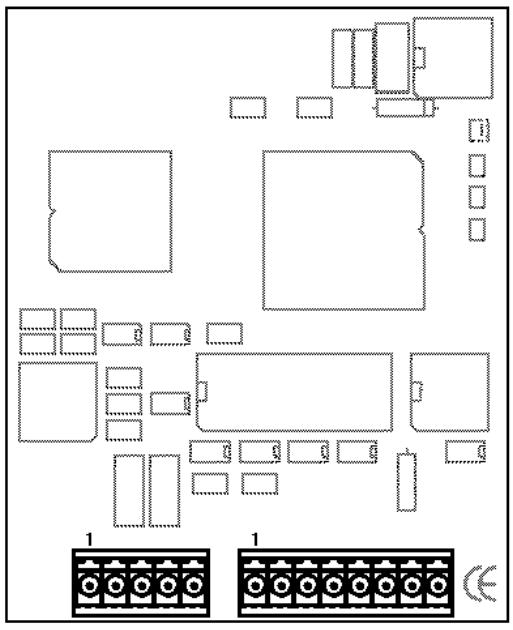
PR 1721 supports these protocols:

PR 1721/01 Profibus-DP slave interface	
PR 1721/02 Interbus slave interface	
PR 1721/03 CANbus slave interface	on request
PR 1721/04 Device-Net slave interface	

3.4.4 Installation of the fieldbus interface

The **fieldbus interface** (RS 485/ differential) is galvanically isolated. The maximum transmission rate is 1,5 Mbit/s. The fieldbus protocol is realized by a plugged in subunit chip. The software for the fieldbus module is activated when switching on the basic unit. The interface board is delivered with two PG9 glands.

Attention: Since December 1999 the connectors of the PR1721 module has been changed.



1_5 .... 5_5 1_8 .... 8_8 terminals

- **Installation:**

The fieldbus connecting unit comprises a card with processor and logic and 13-pole connecting unit. After plugging in the card into the main p.c.b. (caution, 50-pole connector at the universal module, see page 27), the board must be fitted at the two mounting posts with screws.

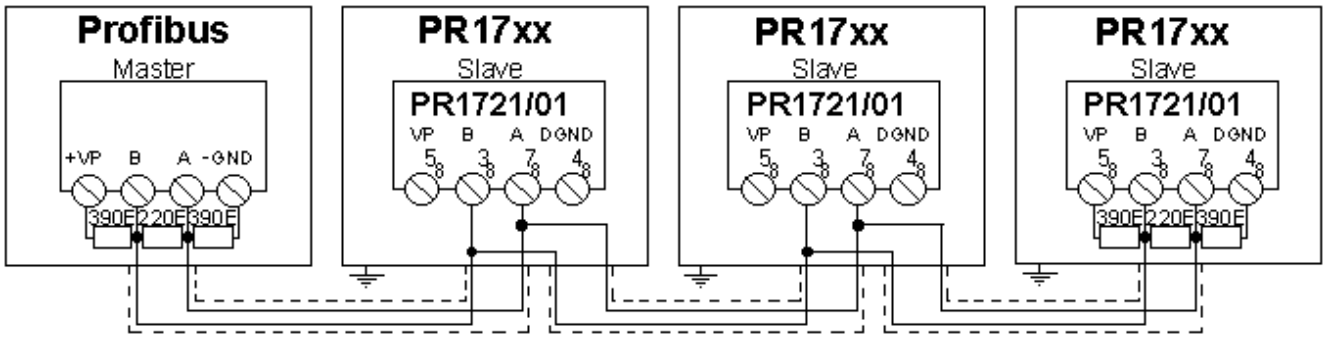
Cable connection:
The blind plugs in front of the connector strip must be replaced with the PG9 cable glands. Bus connection is by means of cables through the metal glands (PG gland) to the 13-pole terminal strip at the fieldbus module. Connect the cable screens completely and exclusively to the glands! The cable conductors must be tied together with a cable strap!

Interbus-S: Ensure that the potential compensation between the instrument and the preceding unit in the bus is provided.

- **Connection of the fieldbus**

	PR 1721/01 **PROFIBUS DP**	PR 1721/02 **InterBus-S**	PR 1721/03 CAN- Bus on request only	PR 1721/04 **Device-Net**
8		Con_Test		
7	Data_A			
6		/DI2 (W_Data in inv.)		
5	VP	/DO2 (W_Data out inv.)		
4	DGND	VCC (+5V)		
3	Data_B	GND (W_Reference)		
2		DI2 (W_Data in)		
1		DO2 (W_Data out)		
5		/DI1 (A_Data in inv.)	CAN_H	V+ (33 mA)
4		/DO1 (A_Data out inv.)	GND	CAN_H
3		GND (Reference)	GND	
2		DI1 (A_Data in)	CAN_L	CAN_L
1		DO1 (A_Data out)		V-

3.4.4.1 PR1721/01 Profibus-DP interface

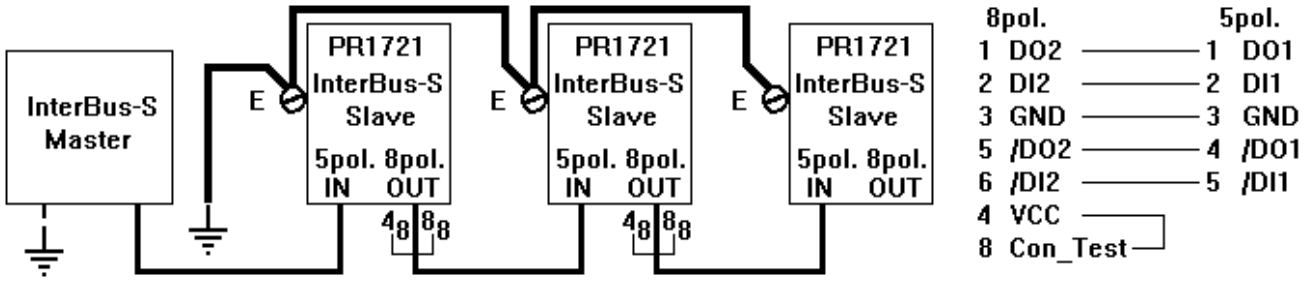


Use screened, twisted bus cable (1x2). Bus termination at both ends by resistors at the bus (220 Ohm) and for power supply (390 Ohm each).

GSD file GWT_00C3.GSD for PR 1721/01 can be copied under our Internet address,

our website in **Internet:** **http://www.global-weighing.com**

3.4.4.2 PR1721/02 Interbus S interface



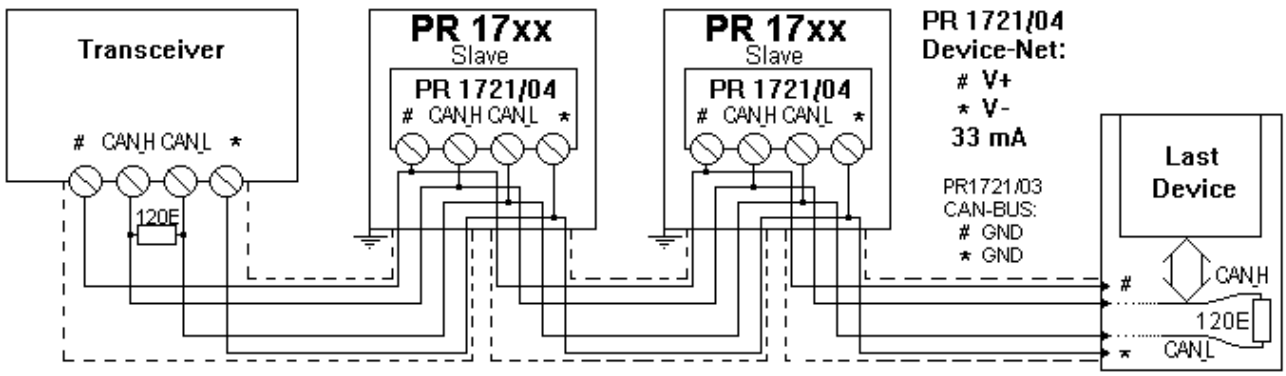
- **Interbus-S connection**:

Please take care for potential equalisation between PR 1720 and the device, which is prior to it in the bus. Use screened, twisted bus cable (3x2).

The bus signal is looped through each module. Both the input and output side must be connected. The bus arrives at pin no. 1_5-5_5 and continues with 1_8-8_8. A gland is provided for each cable.

A link (4_8-8_8) in the output informs the instrument that the bus is continued. Communication is transmitted further to the next unit at bit level.

3.4.4.3 PR1721/04 Device-Net Interface



Use screened, twisted bus cable (2x2). Bus termination at both ends by resistor 120 Ω. PR1721/04 takes 33 mA from the DeviceNet bus supply.

The EDS file for PR 1721/04 can be copied under our Internet address,

our website in **Internet:** **http://www.global-weighing.com**

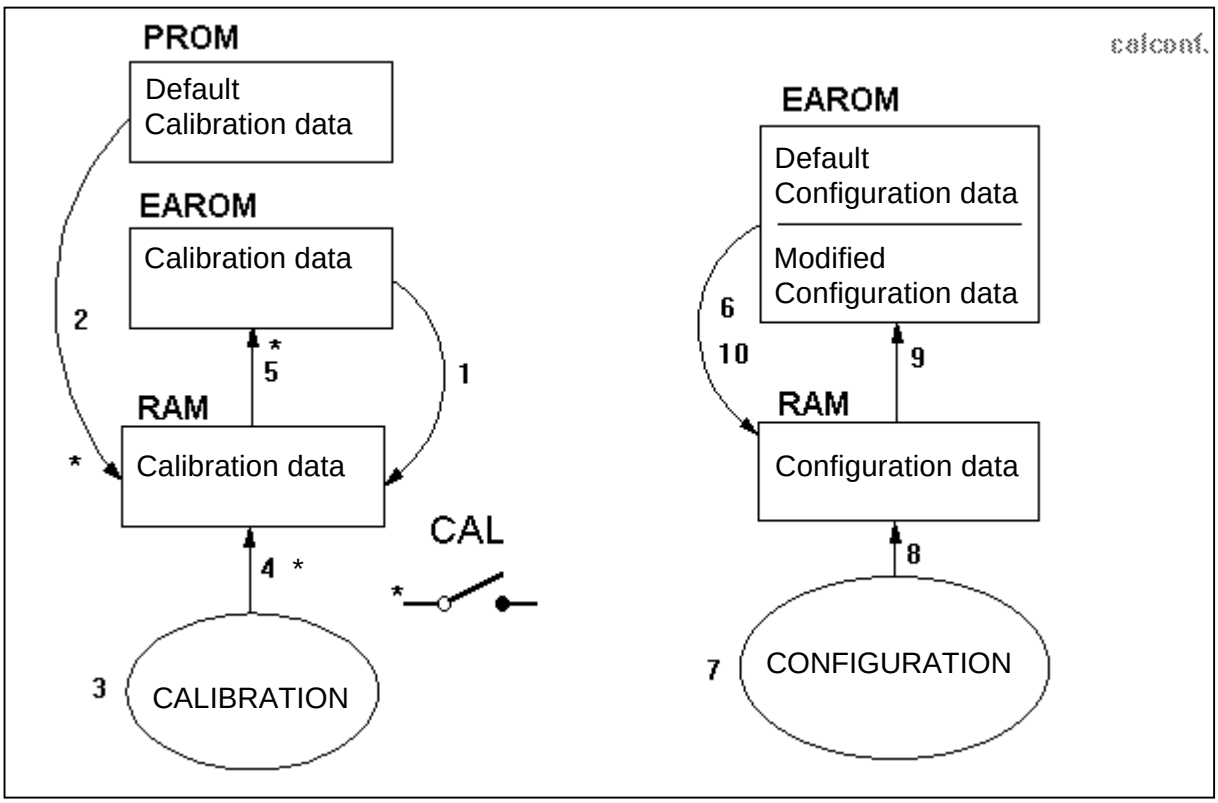
4 PR1713/00 COMMISSIONING

After switching on (possible error message for the fist time: `No valid RAM-data`, if battery jumper is not set, see 3.4.1.) this operation must be followed by a **cold start** (`Cold`) and clock (date and time) adjustment.

4.1 Data saving/ power failure

The configuration/ calibration data are stored in a non-volatile memory (EAROM). Data saving in EAROM is by command (configuration, calibration). A battery is built in. A power failure is registered with a system event (+ PLC address).

Additional write protection (switch, see 3.2) for the calibration data is provided.



4.1.1 Calibration data

Adjustment of: f.s.d. values/ measuring time/ weighing parameters. The calibration parameters must be saved (by command !), Moreover, the calibration parameters can be protected by switch CAL. Before calibration, the unit should be allowed to warm up.

1.	At each power-on, the calibration data are loaded from the EAROM into the working memory.
2.	Function 'new Calibration' loads the pre-set calibration data from the PROM into the working memory, only with switch CAL open.
3,4	During calibration, the calibration data in the working memory are modified.
5.	Function 'Saving calibration' loads the modified calibration data into the EAROM.

4.1.2 Configuration data

Adjusting the serial interface/ communication, field bus parameters. The configuration settings are also saved by command. The configuration settings are independent of switch CAL, i.e. access to the configuration settings is always possible.

6.	With the EAROM deleted, the pre-set configuration data are loaded into the working memory.
7,8	During configuration, the configuration data in the working memory are modified.
9.	Function 'Saving configuration' loads the modified configuration data into the EAROM.
10.	At each power-on, the modified configuration data are loaded into the working memory.

4.1.3 Programming with PR1750

Programming with PR1750 is only possible with the CAL switch open. Project files (.tag, .pco) can be loaded on-line directly to the PR1713 by EW-Com.

Firmware (.hex) can be loaded off-line with menu item `FlashIt` (4.3.2.1). FlashIt!32 also can merge project files.

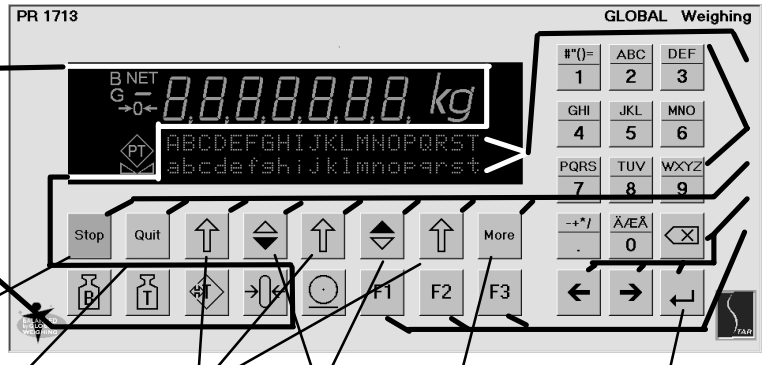
4.1.4 Cold start

With the [Stop] key kept pressed during switch-on (at power recovery), the boot menu is displayed. The user can select:

- cold start (program and database are deleted, interface configuration and calibration data remain unchanged)
- a warm start (all data remain unchanged)

In another menu item, the unit factory setting can be reestablished. Thereby, calibration data, interface configuration and hardware clock are set to standard values. See also operating manual. The boot menu can be called up also from the configuration menu.

4.2 Display elements and controls on the built-in console



The W&M weighing point display cannot be used by programs.

Weighing point keys

Text display with 20 characters per line, alphanumeric + dialogue keys as well as editing keys and function keys can be used by a program.

[Stop] key [Quit] key Softkey Scroll key [More] key [Enter] key [↵]

4.2.1 Control signals

Functions zero setting, tare - untare, weight display mode selection and print-key are allocated to the front-panel keys, i.e. these functions are accessible to the operator. The functions of F1...F3 has to be programmed on demand.

4.2.2 Language

System configuration is exclusively in English. For system operation, two languages are available. The main language is English. With the standard version (factory setting), the alternative language is German. Switch-over is with the front-panel keys (via configuration, see 4.5.3.1).

4.2.2.1 Configuration/ Calibration

Operator dialogue in English.
Operation via console on the front panel,
or via terminal VT100 (compatible)
or with PC terminal software.

4.2.2.2 Operation

Operator dialogue in 2 languages (English or alternative language).
Operation via console on the front panel with 31 keys incl. num. functions,
or with ext. PC-AT keyboard and front-panel display
or via terminal VT100 (compatible)
or with PC terminal software.

4.2.3 Operating concept: Commissioning

PR1713 configuration is on the console (front panel) or, alternatively, with a terminal or a terminal program on PC. The areas for calibration and configuration can be reached from the main menu via menu "Setup". Gross weight display for calibration, if necessary, please: untare + set zero!

Operating concept: PR1713 is menu-guided with softkeys via the front-panel keys. Inscriptions on the ⇧ 3 softkeys below the display are with up to 6 characters per key on the lower display line. The symbols in the lower line of the alphanumeric display limits the softkey inscriptions. Thereby, ▼ means: only these softkeys, and ↧ means: further softkeys with the [More] key.

Example:

```
Reset all to default
YES   ▼ ---- ▼  NO
```

left softkey = yes, right softkey = no

In the main menu press the [More] key, until you read "Setup" above a softkey (see also operating manual). During editing, the [More] key must be used also for selecting the weight unit (g, kg, t, lb.)
Example:

```
♦Set FullScale   ♦
              3000↧kg
```

After [↵] key:
if necessary, change f.s.d. with numeric keys and [More] key.

All parameters can be selected in the lower line. If a rhombus is displayed left and right of a line, the other list items can be displayed using the scroll keys ⇳ to scroll up and ⇳ to scroll down. Only the items which can be configured in the instrument after the adjustments are displayed.

Dependent of function, the input modes are switched over between selection from a menu/ a selection box or entry of alphanumeric characters (editing). The relevant value is displayed beside the parameter, i.e. a quick survey of all configuration settings is possible by parameter 'scrolling'. For editing e.g. parameter 'Baudrate:', it must be selected with [↵] key. In this case, the value for the parameter is chosen by selecting.

The parameters can be left either by [↵] key or [Quit] key. In field 'save', after changes, answer request for saving:

Example:

```
Save Slot 3 RS232?
YES   ▼ ---- ▼  NO
```

YES: changed value is saved
NO: no change, back to menu item above

4.3 Main menu

After connection to the power supply, the unit (the console on the front panel) and the built-in interface cards (the terminal, if provided) are initialized, see 4.1. Text "PR1713 Rel. xx.xx" with the PR1713 version number is built up on the alphanumeric display. The unit can be configured on the front-panel console or (after switching over) on a terminal. The operation of the unit is menu-guided. Calibration and configuration are accessible via menu "Setup" from the main menu.

In the main menu, the PR1713 version number and a choice of application programs are displayed:
with [More] key the next functions are displayed:

```
PR1713 Rel. 01.10
Batch ↡FixTar↡ Count
Setup ↡ ---- ↡ ----
```

Display of main menu depends from the loaded applications (e.g. Batch, Count ...). Dependent of licence or programming, further or other application programs can be selected (with [More] key). Without loaded applications only Setup is displayed. Call up the configuration level with Setup.

Overview on the menu items in the main menu

Menu item	Hint,	Parameter
Fixtar	Application:	Part of the standard application, see operating manual
Count	Application:	Part of the standard application, see operating manual
Prod	Application:	Part of the standard application, see operating manual
Atest	Display	of the testvalue for the analogue part, which was calculated during calibration
Setup	For all	Setup parameters in PR1713 inclusive calibration and licences

4.3.1 Configuration area Setup

In menu 'Setup', the most important PR1713 operating parameters can be adjusted. Configuration of the unit depends from the provided application and the built-in options (the licenses, cards). The menu items are adapted to the equipment of PR1713.

Calibration of the internal WP is in a dialogue. During calibration, all parameters which can be entered are checked. Storage of values which do not make sense is not possible. However, compliance with the relevant (calibration) standards must be checked by the operator (calibration officer). If calibration must be protected against overwriting after saving (weights & measures applications), the CAL switch in the instrument must be closed (for this, disconnect the unit from the power, open it, close the switch (3.2) and connect the unit).

Configuration of PR1713 is made without additional terminal via front-panel display and keyboard. Simply use the scrollkeys and the softkeys in connection with the alphanumeric display. Within setup menu, all items in each level are scrolled in an infinite loop, which can be left to the next higher level by pressing the [Quit]-key. Exception: the calibration loop must be ended by the function keys Save, noSave, Undo. A displayed or selected information is entered by pressing the enter key. The set-up menu is structured as follows:

4.3.1.1 Setup menu

Part 1: Weighing point, calibration data, weighingpoint parameter

Menu item	Hint	Parameter
Setup		For all set up in PR1713 inclusive calibration and licences
Calibration	Calibration:	call up all analog part specific data. New, Modify, Parameter for WP-operating.
New / Modify		Here the calibration data of the scale are specified
Set Fullscale		0.000100 ... 9999900 kg, t, lb, g (dimension with [More], enter value)
Set Stepwidth		1, 2, 5, 10, 20, 50 (select with [More])
Set Deadload		Load, mV/V
Enter Deadload		0.000000 mV/V (enter value only)
Set Span		Load, mV/V
Enter current load		0.0001 ... 9999900 kg, t, lb, g (dimension with [More], enter value)
Enter Span		1.000000 mV/V (enter value only)
Calculate test		calculate testfigure
Exit calibration		Save, noSave, Undo
Parameter		Here the parameters of the scale are specified
Analog filter		on, off
Digital filter		off, bessel, aperiod.
Fcut		0.01 Hz ... 5.00 Hz (enter value only)
Multirage mode		off, on
Multirange limit 1		0 d ... 9999999 d, crossover from small to middle stepwidth
Multirange limit 2		0 d ... 9999999 d, crossover from middle to large stepwidth
Test mode		Absolute, Relative
W & M		Disabled, Enabled
Measuretime		0.05 ... 2.00 s (enter value onlyn)
Standstill time		1 M ... 8 M (enter value only)
Zerotrack time		0 M ... 100 M (enter value only)
Tare timeout		0 M ... 100 M (enter value only)
Standstill range		0.00 d ... 10.00 d (enter value only)
Zeroset range		0.00 d ... 500.00 d (enter value only)
Zerotrack range		0.00 d ... 500.00 d (enter value only)
Zerotrack step		0.00 d ... 10.00 d (enter value only)
Overload		0 d ... 9999999 d (enter value only)
Don't print below		0 d ... 9999999 d (enter value only)
Config	Operation:	call up IEC-1131 program CONFIG, if provided, see 4.6 f.f.
External WP	additional	2nd weighing point, none or connection of PR1720 or user-defined
User defined		user-defined WP B
Fullscale		0.000100 ... 9999900 kg, t, lb, g (dimension with [More], enter value)
Stepwidth		1, 2, 5, 10, 20, 50 (enter)
Overload		0 ... 9999999 d (enter value only)
Minwgt		0 ... 9999999 d (enter value only)
Scale weight/cnt		1kg /1cnt
Scale weight		1 ... 9999900 kg, t, lb, g (dimension with [More], enter value)
Scale counts		1 ... 9999999 (enter)
Update time *50ms		2 ... 20 (enter)
Input address %MD		1 ... 255 (enter)
PR1720		PR1720 as WP B at PR1713/13 DIOS Interbus-S
Update time *50ms		2 ... 20 (enter)
Input IBS address		1 ... 32 (enter)
Set Clock		adjustment of date and time.
.....		see next page

Part 2: Interfaces, communication, softwareparameter

Menu item	Hint	Parameter
.....		see previous page
Serial Ports	Configuration:	serial interface Builtin, Slot1 RS485, Slot1 RS232, Slot2 RS485, ... Slot3 RS232.
Protocol		select for each port: *selection only for not yet used protocols*
X-ON		standard setup & for oper.device
EWCOM V1, ..V2, ..V3		communication, *only possible at one interface in PR1713!*
RTS/CTS		hardware-handshake only for completely connected RS232 interfaces
RemoteDsp		device, *only once in PR1713!*
W&M Print		device, *only once in PR1713!*
Modem		supports Modem-signals, *selection only for RS232 on PR1713/04*
None		possible selection for VDU terminal
Baudrate		data rate: 300, 600, 1200, 2400, 4800, 9600, 19k2
Bits		data transfer: 7, 8
Parity		data transfer: None, Odd, Even
Stopbits		data transfer: 1, 2
Slaveadr		A - Y (enter) *only with protocol:* ASYCOM Vx.
Device		terminal mode: Raw-I/O, VT52, Ansi
Echo		Disabled, Enabled
Software Parameter		configuration of some basic parameters, language, operating, ...
Language		English, Local Language
Key timeout		operating, console: 1 ... 3 sec
Low battery Check		On, Off, 1 min
Lines/Recipe		1 ... 255 (enter)
Recipe simulation		on, off
Report to		communic. &proloc, communication, proloc, none
Tare key		Enabled, Disabled
Set zero key		Enabled, Disabled
Allow quit		on, off
Reset on stop+quit		1 sec, 5 sec, disabled
S88.01 Interface		batching functionen: on, off
Printer Device at		Builtin, Slot1 RS485, Slot1 RS232 .... Slot3 RS232
Operator Device at		Builtin, Slot1 RS485, Slot1 RS232 .... Slot3 RS232
Fieldbus Parameter	Fieldbus:	configuration of the optional fieldbusinterface PR1721/xx
PR1721 protocol		none, Interbus-S, Profibus-DP, DeviceNet
Interbus-S		for PR1721/02
IBS cycle		1 ... 50 (enter)
Profibus-DP		for PR1721/01
Profibus-DP address		1 ... 126 (enter)
DeviceNet		for PR1721/04
DeviceNet baudrate		500k, 250k, 125k
DeviceNet MAC-ID		0 ... 63 (normal 1 ... 60)
Scale-interface	select:	Disabled, Enabled (8 Byte standard interface between scale and fieldbus)
Show Boardnumber		display of the instrument serial number for licences
Licence Setup		licence number management, Show, Add, Delete
Print Setupdata		initialization data print-out on the selected interface
Refresh Display		refresh display, all segments on
Show Version		version number display of firmware und BIOS
Reboot		selects cold start/ warm start/ boot menu

4.3.2 Boot menu

The boot menu is set-up sub-item '`Reboot`'. When pressing foil-covered [Stop] key during instrument switch-on, a boot menu is displayed on the unit.

- If warm start is possible:

```
STOP-Key pressed
 Cold ▼ Warm  ▼ Flash
```

`Cold` all programs and tables loaded in the memory are deleted
`Flash` program loading (also parts).
`Warm` all data remain unchanged

The calibration data remain always unchanged. They can be changed only in the calibration procedure.

- If warm start is not possible:

`STOP-Key pressed` ` Cold ▼ Erase ▼ Flash`	`Cold` all programs and tables loaded in the memory are deleted `Flash` program loading (also parts).

`Erase` deletes the EAROM

By Erase all calibration and configuration data are adjusted to the factory settings.

Safety prompt for:

`Erase all data?` ` YES ▼ ---- ▼ NO`	YES NO	Data are overwritten all data remain unchanged

Possible error message

`Erase not possible` `CAL-Jumper closed`	when switch CAL is closed

If a warm start is not possible (e.g. due to a system crash or because of an empty battery), various texts are displayed on the upper display line:

`Reboot done`	Restart from the operating level was carried out
`Flash complete`	Loading of a new software was completed
`Flash cancelled`	Loading of a new software was canceled
`Fatal error reboot`	A fatal error occurred before restart.
`No valid firmware!`	The firmware checksum is faulty.
`BIOS too old`	*) Faulty BIOS version (BIOS too old, after new firmware was flashed)
`STOP Quit Reset`	Unit was reset with [Stop] key and [Quit] key

*) The BIOS must not be flashed without this message! Do not interrupt the flashing, because the loader program for FlashIt!32 is included in the BIOS, otherwise PR1713 needs to be repaired.

In these cases, a warm start is not possible:

```
Reboot done
 Cold ▼ Erase ▼ Flash
```

Possible operation:

(`Cold`) A cold start is made

Messages:

`Check firmware…`	The firmware checksum is tested.
`Firmware coldstart…`	A cold start is carried out.

(`Erase`) A warm start is made (if possible).

Messages:

`Check firmware…`	The firmware checksum is tested.
`Firmware warmstart…`	A warm start is made.

(`Flash`) Loading of new software is prepared (loading of new software, 4.3.2.1).

Further options are displayed with [More] key:

```
Reboot done
 Test ▼ SAD  ▼ DBGR
```

(`Test`) Various hardware tests are called up

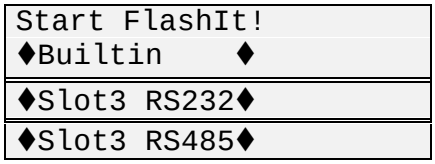
The middle and the right softkey must not be used: further internal test functions which can lead to undefined behavior of the unit are started.

4.3.2.1 Loading new firmware

The PR1713 includes firmware with application for standard use. A firmware without application may be used for projects. You need FlashIt!32 Rel 2.04, if you want to replace the application-PLC with your own PLC-project. Firmware and PLC program can be taken from the Complementary SW-Tool box CD or from our internet address. Update the BIOS only if requested by the instrument.

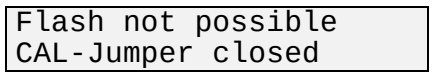
Warning: Do not interrupt the flashing, because the loader program for FlashIt!32 is included in the BIOS, otherwise PR1713 needs to be repaired.

Prepare PR1713: Open menu *Setup*, select submenu *Reboot*, select menu item *Reboot*, wait for message *Reboot done*. Then select menu item *Flash*, select the serial port:



After the softkey `Flash` in bootmenu select the serial port, which is to be used for downloading the program.

Possible error message

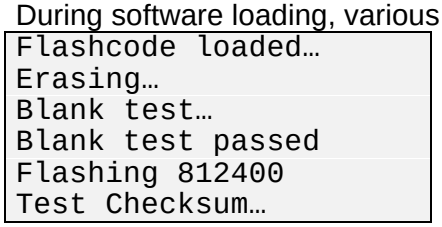


with switch CAL closed

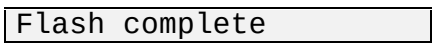
If the serial port "Builtin" is occupied, the interface can be selected with ▲▼ and ▲▼ (only available, if a serial I/O card PR1713/04 is inserted).

Prepare the PC: FlashIt!32 must be started now on the connected PC. Select firmware file from the list in the window, press flash-button, wait for message *completed*.

During software loading, various status messages are displayed:



Subsequently, the boot menu with the following status line is displayed again:



After that initialize PR1713 with *Cold*. Flash erases the databanks of PR1713, therefore Erase is not necessary before Flash, to erase internal databanks. If Erase was started, the safety question has to be answered before erase is executed, after that Reboot.

4.4 Calibration, weighingpoint parameters

Standard calibration of the analog part by weights and mV/V can be realized on the console (front panel or terminal) of PR1713. Additionally, the CAL hardware switch is provided in the instrument. Calibration data changing, download and flash functions only, if the switch is open. If calibration is active, press gross key [B] for a 10 fold magnifier (toggle).

4.4.1 Calibration sequence

The sequence is started with 4.4.2.1 'Calibration'. 4.4.2.2. 'Set Fullscale' is reached with 'New' or 'Modify'. Changing to the next item is with scroll down (up to 4.4.2.7 'Exit calibration') or with scroll up key in an endless loop up to the previous menu item of these chapters. The endless loop can be left with [Quit]: without changes or, as described in 4.4.2.7 after changes, in order to cancel the new settings or to save it.

4.4.2 Start messages

When calling up the calibration, various error messages can be displayed:

```
Can not calibrate
Jumper is closed
```

The jumper (switch CAL) is closed.

```
Tare activ
```

The scale was just tared.

```
Calibration activ
```

The scale is calibrated via another interface.

```
Weighingpoint in use
```

The scale is just busy (e.g. batching).

Otherwise, selection if the existing calibration shall be modified, or if a new calibration shall be started must be made.

4.4.2.1 Selecting the calibration mode

```
Calibration
New   ▼Modify▼ Param
```

(New) starts a new calibration with default values (deadload= 0 mV/V, FSD= 3000 kg ≅ 1 mV/V). A safety prompt is made:

```
Reset all to default
YES   ▼ ---- ▼  NO
```

(YES) sets the default values and starts the calibration
➔ "4.4.2.2 Set FullScale"

(Modify) permits changing of the existing calibration.
➔ "4.4.2.2 Set FullScale"

(Param) changes the measuring parameters
➔ "4.4.3 Set Parameters"

4.4.2.1.1 10 fold magnifier

A 10 fold magnifier function for the weight display can be enabled during calibration with the [B] gross key (toggle).

4.4.2.2 Set FullScale

```
♦Set FullScale   ♦
                3000kg
```

A weight (inclusive of '.') can be entered, the unit can be changed with [More] key.
Press [↵] key to set the full-scale. Display:

```
Setting FullScale…
                3000kg
```

Further keys:

⇳ returns to ➔ "4.4.2.7 Exit calibration"

⇳ skips and goes to ➔ "4.4.2.3 Set Stepwidth"

[Quit] cancels the calibration after safety prompt.

4.4.2.3 Set Stepwidth

```
♦Set Stepwidth   ♦
  1 ↧    2 ↧    5
```

⇧ selects the stepwidth, the [More] key changes between stepwidth 1 and stepwidth 10.

Further keys:

⇳ returns to ➔ "4.4.2.2 Set FullScale"

⇳ skips and goes to ➔ "4.4.2.4 Set Deadload"

[Quit] cancels the calibration after safety prompt.

4.4.2.4 Set Deadload

```
♦Set Deadload    ♦
 ---- ▼ Load ▼ mV/V
```

Discharge the scale and set the deadload with softkey (Load) in the middle, display:

```
Setting Deadload…
```

Subsequently ➔ "4.4.2.5 Set span"

Or right softkey (mV/V), display:

```
Enter Deadload
          0.123456mV/V
```

The entry is followed by:

```
Setting Deadload…
          0.123456mV/V
```

and by ➔ "4.4.2.5 Set span"

Further keys:

Returns to "4.4.2.3 Set stepwidth"

Skips and goes to "4.4.2.5 Set span"

[Quit] cancels the calibration after safety prompt.

4.4.2.5 Set span

```
♦Set Span        ♦
 ---- ▼ Load ▼ mV/V
```

Load the scale and set the span with the softkey (Load) in the middle, display:

```
Enter current load
                3000kg
```

Entry of the weight, [↵] key, is followed by display:

```
Setting Span…
                3000kg
```

Subsequently, ➔ "4.4.2.6 Calculate test"

Or right softkey (mV/V), display:

```
Enter Span
          1.234567mV/V
```

The entry is followed by:

```
Setting Span…
          1.234567mV/V
```

Subsequently ➔ "4.4.2.6 Calculate test"

Further keys:

returns to "4.4.2.2 Set FullScale"

skips and goes to "4.4.2.6 Calculate test"

[Quit] cancels the calibration after safety prompt.

4.4.2.6 Calculate test

♦Calculate test ♦ Test ▼ ---- ▼ ----

The left softkey (Test) calculates the test value, display:

Calculate test…

➔ "4.4.2.7 Exit calibration"

Further keys:

- ⇳ returns to "4.4.2.5 Set span"
- ⇳ skips and goes to "4.4.2.7 Exit calibration"
- [Quit] cancels the calibration after safety prompt.

4.4.2.7 Exit calibration

♦Exit calibration♦ Save ▼noSave▼ Undo

(Save) stores the calibration, display:

Saving Calibration…

.... then

Exit Calibration…

(noSave) finishes the calibration without saving, display:

Exit Calibration…

(Undo) cancels the calibration, the following safety prompt is displayed:

Undo calibration? YES ▼ ---- ▼ NO

(YES) cancels the calibration, all changed values are lost.

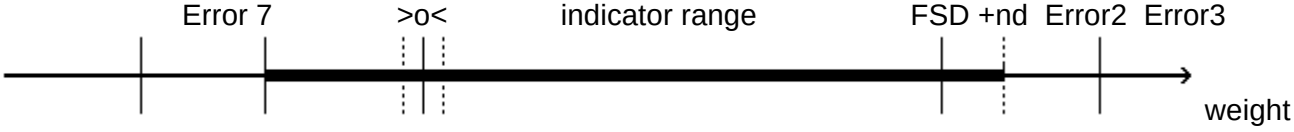
4.4.2.8 Calibration error messages

FSD not mult. of Step	F.s.d. value cannot be divided by stepwidth.
To many d for signal	Error message at < 0.3mV/V for 3000d (W&M active), resolution too high with too low input signal. PR1713 tries to reach a valid setting by increasing the default values (to FSD ≅ 3 mV/V and stepwidth 50).
FSD below cal weight	New f.s.d. smaller than calibrated weight.

4.4.2.9 Error messages on the weight display

Only analog part error status's are output on the weight display. They are displayed in coded form 'Error x' .

Display	Signification/ cause
Error 1	internal arithmetic overflow (faulty calibration values)
Error 2	input voltage is above f.s.d. + overload
Error 3	input voltage is above the permissible range of 36 mV. However, an error in the analog section, in the load cell, or a cable break is also possible.
Error 7	input voltage negative or incorrect load cell connection
Error 8	ADU error, e.g. hardware defective or overloaded



Scale with spans for error and load.

4.4.3 Set Parameters

Calibration New ▼Modify▼ Param

The softkey (Param) changes the measuring parameters

In menu 'Set Parameters', the most important PR1713 operating parameters can be adjusted. Various functions can be selected:

Display	Parameter (range)
♦Analog filter ♦	Analog filter for the measuring signal (off, on)
♦Digital filter ♦	Select Filter characteristics (Bessel, aperiod.), or "off".
In case of Digital filter = on:	Enter filter cutoff frequency (0.10 up to 5.00 Hz).
instead of Measuretime ♦Fcut ♦	Measuretime is fixed to 50 ms.
♦Test mode ♦	Operating mode for the test value (Absolute/ F.S.D., Relative/ 0)
♦W & M ♦	Operating mode W & M (Disabled, Enabled)
With W&M enabled:	• Printing only on W&M printers, special protocol • No calibration possible below 0,3 mV/V at 3000 d • negative weight: without weight unit, remote display dimmed
♦Measuretime ♦	Measuring time, 50 ms or multiples of 100 ms (0.05, 0.10, 0.20.. 2.00)
♦Standstill time ♦	Time for standstill detection (1..8 M = Measuring time)
♦Zerotrack time ♦	Time for cyclical automatic zero tracking (0..100 M)
♦Tare timeout ♦	Time for abort of inexecutable tare-/ zero set action (0..100 M)
♦Standstill range ♦	Range for standstill detection (0..10.00 d)
♦Zeroset range ♦	zero set range and range for automatic zero tracking (0..500.00 d)
♦Zerotrack range ♦	Range for automatic zero tracking with zero drift (0..500.00 d)
♦Zerotrack step ♦	Step width for automatic zero tracking (0..10.00 d)
♦Multirange mode ♦	Operating mode for multirange scale (off, on)
♦Overload ♦	Max. permissible overload value above full scale (0..9999999 d)
♦Don't print below ♦	W & M: lower weight limit for print-out (0..9999999 d)
	Form of printing may be changed in the application program.
♦Multirange limit 1♦	Multirange scale, first change-over limit (0..9999999 d), 0 = off
♦Multirange limit 2♦	" ", second change-over limit (0..9999999 d), 0 = only 2 ranges

4.4.3.1 Multirange scale

The multirange function is controlled by three parameters in the calibration (see above). With *Multirange mode= on* the scale has three ranges with different resolution: the change-over limits *Multirange limit 1* and *Multirange limit 2* represents the range border. If the gross weight has more d as the relevant change-over limit, the next (wider) stepwidth is used (1->2->5->10->20->50).
If the gross weight is <= 0.25 d of the lowest range, the scale in standstill and untared condition, the scale will be switched back to the lowest range. On the display the ranges are marked by quotes or dashes (**'** range 1, **"** range 2, **=** range 3) in front of the weight value.
During Calibration the multirange function is principally switched off. With weights & measures application a label for the range must be placed above the 1st. digit of the weight display.

4.4.3.2 Leaving 'Set Parameters'

Save configuration ? Save ▼noSave▼ Undo

After [Quit] key:

Save	(data)
noSave	(data)
Undo	(restore)

Parameters are stored in EAROM after Save.

4.4.4 External Wp

Additional 2nd weighing point

External Wp B ♦User defined ♦	user-defined
♦PR1720 ♦	PR1720 via Interbus-S interface in PR1720
♦none ♦	no weighing point B

The user-defined weighing point B gets data via SPM variables, which are output as weight. The scale is defined with the following points:

♦Fullscale ♦ 1000 kg	f.s.d. (can be edited after pressing [↵] key): digits, dimension with [More] key
♦Stepwidth ♦ 1	stepwidth 1, 2, 5, 10, 20, 50
♦Overload ♦ 0d	scale overload range in d
♦Minwgt ♦ 0d	Min. weight for starting a print order (corresponds to "don't print below“)
♦Scale weight/ cnt ♦ 1 kg/ 1 cnt	Scale resolution weight per count
♦Update time *50 ms♦ 6	Multiples of 50 ms define the measuring time
♦Input address %MD ♦ 32	SPM-variable for weight value free address for a double word

A PR1720 as weighing point B requires the following specifications:

♦Update time *50 ms♦ 6	Multiples of 50 ms define the measuring time
♦Input IBS address ♦ 3	The Interbus S remote bus address indicates, which module is (1 ... 4) PR1720.

The additional weighing point is stored or canceled with selection

Save Extern WP-data YES ▼ ---- ▼ NO

4.5 Configuration of not weighingpoint parameters

The configuration of all parameters, which does not belong to the internal weighing point, is divided into several sections (see 4.3.1.1. Setup Menu).

4.5.1 Set Clock

For adjusting date and time, select 'Time' or 'Date' with the scroll key. The enter key [↵] opens the fields and sets the new data.

Set Clock ♦Time ♦ 05:05:09	actual system time, changing is possible after pressing key [↵], setting is possible after pressing [↵].
Set Clock ♦Date ♦ 06.05.1999	actual system date, changing is possible after pressing [↵], setting is possible after pressing [↵].

4.5.2 Serial Ports

Configuration of serial interfaces. After selecting "`Serial Ports`" the menu `Setup serial` for selection of a serial interface is opened:

```
Setup Serial
Port: ♦Builtin     ♦
```

Order is dependent of configuration: Builtin RS 232, slot1 RS 485, slot1 RS232, slot2 RS485, slot2 RS232, slot3 RS485, slot3 RS232
only existing interfaces are displayed

The following specifications can be provided for each selected serial interface:

```
Setup Builtin
♦Protocol          ♦
```

Adjustable parameters for interface Builtin (or selected)
Protocol of interface

- "None ", No protocol
- "X-ON ", Xon/ Xoff
- "EWCOM V1", EW protocol V1 standard ⎫
- "EWCOM V2", EW protocol V2 multi-program PR1740 ⎬ *)
- "EWCOM V3", EW protocol V3 DDE server ⎭
- "RTS/CTS ", Hardware protocol
- "RemoteDsp", Remote display string ⎫
- "W&M Print" Printer string ⎭ *)

*) The protocols EWCOM V1 or V2 or V3, as well as RemoteDsp and W&M Print can be allocated only once per unit. They are not displayed any more, if they are in use elsewhere.

```
Setup Builtin
♦Baudrate          ♦
```

Make data rate and protocol equal to connected serial interface.
Adjustable Baudrate: 300, 600, 1200, 2400, 4800, 9600, 19200

```
Setup Builtin
♦Bits              ♦
```

Data bits
7, 8

```
Setup Builtin
♦Parity            ♦
```

Parity bit
None, odd, even

```
Setup Builtin
♦Stopbits          ♦
```

Stop bits
1, 2

```
Setup Builtin
♦Slaveadr          ♦
```

Slave address A to Z is only selectable with EW protocol

```
Setup Builtin
♦Device            ♦
```

Unit at the interface: raw I/O or terminal
Raw I/O (printer, remote display, communication), ANSI, VT52

```
Setup Builtin
♦Echo              ♦
```

character echo
Disabled, enabled

4.5.3 Software parameters

```
Setup
♦Software Parameter♦
```

Configuration of some basic parameters. General specifications for parameters, e.g. language, console, ... can be made:

4.5.3.1 Language

```
Language
♦English           ♦
♦Local Language    ♦
```

Selecting the dialogue language for the operator (not for configuration).
English (default)
Default alternative language: German

4.5.3.2 Key timeout

```
♦Key timeout       ♦
                2 sec
```

Time-out for display of net and gross display mode function keys.
1, 2 or 3 sec

4.5.3.3 Low Battery Check

♦Low battery Check ♦
♦ ON ♦

Battery test, result on weight display: = weak
On, Off, 1 min. (repeat cyclically each minute)

4.5.3.4 Lines/ Recipe

♦Lines/Recipe ♦
34

Maximum number of lines for recipes
1 255

4.5.3.5 Recipe simulation

♦Recipe simulation ♦
on

Recipe simulation on/ off. For starting recipes with modified batching modules, recipe simulation can be switched.

4.5.3.6 Report to

Configuration item for reports in the batching device. The queue of batch reports is limited to a maximum of ten entries. In a case of error in communication or printer, the operator is informed and asked if he wanted to delete the oldest report.

♦Report to ♦
♦communic. & proloc♦
♦ communication♦
♦ proloc♦
♦ none♦

Specify destination for reports, select with scroll keys for:
communication (PR1740) and Proloc (local printer)
Communication (PR1740)
Proloc (local printer), stand allone
No reports for devices without local printer / PR1740

4.5.3.7 Tare key

♦Tare key ♦

Taring from the front panel is possible (front-panel console)
Enabled = yes, disabled = no

4.5.3.8 Set zero key

♦Set zero key ♦
Enabled

Zero setting from the front panel is possible (front-panel console)
Enabled = yes, disabled = no

4.5.3.9 Allow quit

♦Allow quit ♦
on

"on": The main configuration menu can be left with Q at the **terminal**, the interface is free. "off": Q is effective.

4.5.3.10 Stop + Quit

♦Reset on stop+quit ♦
♦1sec♦

After pressing keys [Stop] and [Quit] simultaneous for duration of n sec during operation, the boot menu is displayed.
n = "1sec", "5sec", "disabled" Reset switched off.

4.5.3.11 S88.01 Interface

```
♦S88.01 Interface   ♦
                  off
```

"off": Unit at PR1740 or stand-alone.
"on": Standard function module on, unit is used with InBatch.

4.5.3.12 Printer Device at (System printer)

```
♦Printer Device at  ♦
      ♦Builtin RS232♦
```

Switches the printer to a serial interface. All available interfaces are selectable with the scroll key.
Example: "slot 1 RS232" requires a printer at the RS 232 interface on slot 1.

4.5.3.13 Operator Device at (System console)

```
♦Operator Device at ♦
      ♦Builtin RS232♦
```

Switches the console to a serial interface. All available interfaces are selectable with the scroll key.
Example: "slot 3 RS232" requires a terminal at the RS 232 interface on slot 3.

4.5.4 Fieldbus Parameter

Select protocol, parameter and operating mode for the optional fieldbus interface PR1721/xx.
In operating mode Scale-Interface Enabled a standard interface with 8 byte between scale and fieldbus is established. In operating mode Scale-Interface Disabled an IEC 1131 application program in PR1713 is needed to support the fieldbus interface.

4.5.4.1 PR1721 protocol

```
♦PR1721 protocol    ♦
                 none
```

displayed only, if the PR1721 module is inserted in the unit.
None, Interbus-S for ./02, Profibus-DP for ./01, DeviceNet for ./04
Dependent of selection, other parameters are required, e.g.:

With **Interbus-S**, value n (1 ... 50) indicates the actualization interval.
Calculate the value by: 66,7+number of bytes+ 0.3 x number of slaves.

```
♦IBS cycle / 25 ms  ♦
                   10
```

Enter address for **Profibus-DP**.
(1 ... 126)

```
♦Profibus-DP address♦
                    1
```

For **DeviceNet** enter two parameters.
Baudrate selectable to 500k, 250k, 125k

```
♦DeviceNet baudrate ♦
                 500k
```

The MAC-ID identifies the device.
Enter address (1 ... 60)

```
♦DeviceNet MAC-ID   ♦
                    1
```

After parameter entry, PR1713 makes a warm start, in order to initialize the PR1721 module in the unit.

4.5.5 Show Boardnumber

```
Boardnumber 123456789
♦Show Boardnumber  ♦
```

The board number is displayed.
This number is required to order a licence.

4.5.6 Licence Setup

Licences for stand-alone operation: PR1713/20, PR1713/21
Licences for operation at InBatch: PR1713/30, PR1781/13, PR1791/13
Licences for operation with PR1740: PR1740/11, PR1740/21, PR1740/31, PR1740/41

Setup ♦Licence Setup ♦	Licence number management, entry of licence number
Licence Setup Show ▼ Add ▼Delete	Select the required action with the softkeys, e.g.
Licence Show ♦PR1713/20 ♦:Enabled	The status for all licences is displayed Enabled, Disabled
Add Licence Enter number 0	Enter the number of the licence selected previously. Message 'Wrong licence No' or 'PR... enabled' (number correct) is displayed.
Delete Licence Enter number 0	Enter the number of the previously selected licence. Message 'Wrong licence No' or 'PR... disabled' (number correct) is displayed.

4.5.7 Print Setupdata

Setup ♦Print Setupdata ♦	prints out the initialization data via the in 'software parameter' selected interface. After pressing the enter key [↵] the print-out is started.

4.5.8 Refresh Display

Refreshing the weight display intensity

The weight display elements, which are used very rarely, gradually loose their brightness. Consequently, the luminosity e.g. within a digit can be different. However, regeneration of the display intensity is very easy.

Setup ♦Refresh Display ♦	refreshing the display: after pressing [↵], all display segments are off, for refreshing the display intensity, wait approx. 5 min. After the [Quit] key, the display is controlled normally again.

4.5.9 Show Version

Setup ♦Show Version ♦	display of version number in the bottom display line, select with scroll keys, e.g.:
♦Firmware Version ♦	"PR1713/00 rel. xx.xx. rev.xx.xx.xxxx xx:xx" (flash firmware)
♦BIOS Version ♦	Part of the operating program

4.5.10 Reboot

Setup ♦Reboot ♦	The system can be initialized via this menu.
Reboot Cold ▼ Warm ▼Reboot	Cold = cold start (with deletion of programs and tables). Warm = warm start. Reboot = starts the boot menu.
Reboot done Cold ▼ Warm ▼Reboot	completes the boot operation

4.6 Config program (set-up menu)

Configurations in menu 'Config' are made on the front-panel console. IEC1131 program 'Config' is used for determination of limit values, fixtare memory, printer interface and some parameters for batching with PR1713. The individual parameters are displayed successively with the scroll keys, as long as they are between the selection markings ♦. For parameters which can be selected by pressing the Enter key [↵], the preset value can be entered. If a selection list exists for the parameter, the selection markings ♦ are at both sides of the preset value.

```
Config project
Vers  ♦Edit  ♦Print
```

Remarks 1st line: **(parameter)**
after `Edit:` 2nd line **(preset value)**

report text	...1, ...2
print	layout
start	...name, ...value, ...cycle number, ...recipe now?
WP: limit	...A 1 on, ...A 1 off, ..., ...B 2 on, ...B 2 off
printer	device
batchrep.	auto prt
comp. &	recipe I/O

4.6.1 Production report parameters

The batchreport of the last batch contains headlines, date, recipe, production data and a line for each component (see PR1713 operating manual). The two headline texts in the reports can be edited freely (company name, address...). The report functions were realized as IEC 1131 module (they are available on CD, i.e. the reports can be matched by the user by means of the PR1750 programming system.

```
♦Report text 1     ♦
no text
```

20 characters of freely definable text, which appears in the batch report (first text) e.g. company name

```
♦Report text 2     ♦
no text
```

20 characters of freely definable text, which appears in the batch report (second text) e.g. company address

4.6.2 Layout of printed reports

With the printkey ⦿ on the frontpanel the weight can be printed in a predefined format to a connected printer. The adaption of the printing mask can be managed with

```
♦print layout      ♦
;D-G-
```

The standard-report starts with an empty line, it follows date and time, a line of 40 dashes, the grossweight, 40 dashes and new line.

You may select:

D	Date and time,	`Datum: xxxx yy`	, new line
G	Grossweight,	`Brutto: 1234 kg`	, new line
N	Netweight,	`Netto: 1234 kg`	, new line
T	Tareweight,	`Tara: 1234 kg`	, new line
-	Line of 40 dashes		, new line
1	the contents of report text 1		, new line
2	the contents of report text 2		, new line
;	new line		

4.6.3 Batch parameters

```
♦Start name        ♦
```

If a recipe name is entered, no prompt for the name is displayed when starting the batch. The recipe is started with this name.

♦Start value ♦ 0 kg

If a set-point <>0 is specified, no prompt for the set-point is displayed when starting the batch. The recipe is started with this set-point. The recipe start procedure stores the last used setpoint for each recipe.

♦Start cycle number♦ 0

If a number of cycles <>0 is entered, no prompt for the number of cycles is displayed when starting the batch. The recipe is batched as many times as specified.

♦Start recipe now? ♦ start

With `start` batching starts immediately. With `inquiry` the question `Start recipe now?` is displayed before a batch is started.

`Start recipe now?` could be used to enter an setpoint for this recipe with no need to start a production. This could be done by e.g. digital input, and a recipe number must be selected. After that, the required amount of production can be done by closing a switch. The operator can easily change the start up values at the console.

4.6.4 Limit values

2 limit values with independent values for on and off for monitoring are provided for weighing point A in PR1713 (i.e. 2nd WP B). The limit value as limit 1 or 2 of weighing point A or B can be defined freely for a weight with on or off. Specification is via configuration, but can also be changed via communication.

Attention: PR1713 does not check, if the input fits into the scale range.

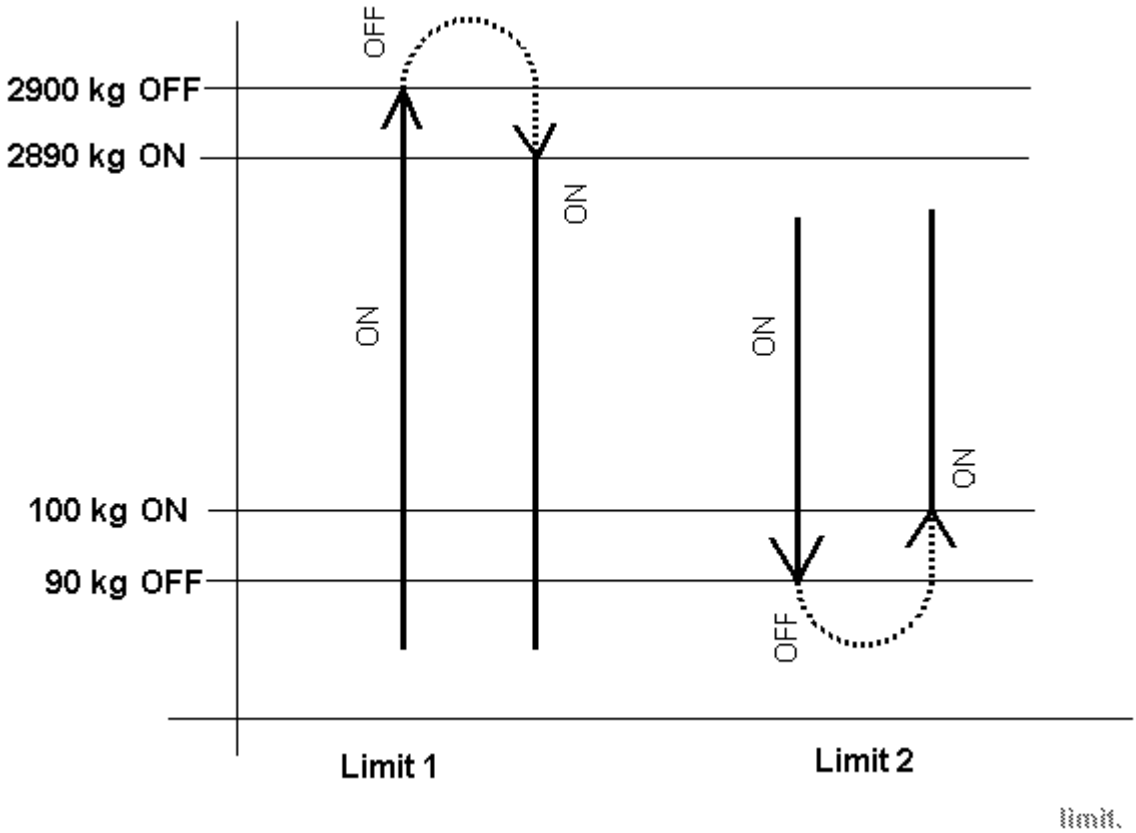
♦WP: A limit 1 on ♦ 0 kg	weighing point A, limit value 1 switch-on point
♦WP: A limit 1 off ♦ 0 kg	weighing point A, limit value 1 switch-off point
♦WP: A limit 2 on ♦ 0 kg	weighing point A, limit value 2 switch-on point
♦WP: A limit 2 off ♦ 0 kg	weighing point A, limit value 2 switch-off point
♦WP: B limit 1 on ♦ 0 kg	weighing point B, limit value 1 switch-on point
♦WP: B limit 1 off ♦ 0 kg	weighing point B, limit value 1 switch-off point
♦WP: B limit 2 on ♦ 0 kg	weighing point B, limit value 2 switch-on point
♦WP: B limit 2 off ♦ 0 kg	weighing point B, limit value 2 switch-off point

Limit values Example for switch-on and off values (hysteresis)

For a min. limit value 2 of 100 kg and a max. limit value 1 of 2900 kg. The hysteresis is 10 kg with the two limit values. The output for min. limit value 2 must not be activated when exceeding, and the output for max. limit value 1 must not be activated when exceeding. I.e. with power failure/ = inactive outputs, the limit values are exceeded (safety status e.g. fill checking via the limit values).

Via output configuration, limit values 1 or 2 are allocated to the relevant output (including levels 0 ->1 or 1-> 0).

If the values for ON and OFF are equal, the limit value output is switched to ON, when exceeding the limit value.



4.6.5 Printer interface

One of the free PR1713 interfaces (Builtin or interface card) can be defined as printer interface. A serial ASCII printer can be used.

♦Printer device ♦ Builtin	interface via which all print-outs are made: Builtin

Select the sub-menu with the Enter key [↵]. The selection markings in the bottom line permit selection of one of the available interfaces. Selection is dependent of the additional interface cards provided in PR1713:

♦Printer device ♦	Sequence: Builtin, Slot 1 RS485, Slot 1 RS232, Slot 2 ....
♦ Builtin ♦	the RS232 Builtin
♦ Slot1 RS485 ♦	the RS485 on the first additional interface card is TTY1:
♦ Slot1 RS232 ♦	the RS232 on the first additional interface card is TTY2:
♦ Slot2 RS485 ♦	the RS485 on the second additional interface card is TTY3:
♦ Slot2 RS232 ♦	the RS232 on the second additional interface card is TTY4:
♦ Slot3 RS485 ♦	the RS485 on the third additional interface card is TTY5:
♦ Slot3 RS232 ♦	the RS232 on the third additional interface card is TTY6:

♦batchrep.auto prt ♦ off	`off`	no printing, but only the last report is kept in memory
	`auto`	print immediately, the last report is kept in memory

4.6.6 Digital I/O Coding

The digital outputs (Components) and the digital inputs (recipe numbers) can be addressed directly or binary (up to 255 over 2 cards).

♦Comp.&_recipe I/O ♦ ♦ single ♦	digital in- and outputs are addressed directly
♦Comp.&_recipe I/O ♦ ♦ binary ♦	digital in- and outputs are addressed binary

4.7 Enter fix-tare weights

After selecting softkey 'Fixtar' from the main menu:

Fixtare no name ♦ 1♦ 0.00 kg	is displayed. 9 Fixtare memory can be opened for entry of a fixed tare value and their name.

This menu can be used for taring the weight display with a fixtare value, editing the fixtare value and loading the actual gross weight into the fixtare memory. Several fixtare values can be selected. After selecting a number an other menu is displayed:

Fixtare no name Tare ♦Edit ♦Weight	Edit : enter tare weight and name; Weight: gross=tare, enter name;	Tare : tare WP A Print : single or all

4.8 Count factors

After selecting softkey 'Count' from the main menu:

Count no name ♦ 1♦ 87 pcs	9 memory locations can be prepared for fixed count factors and their name to realize a counting scale.

With the count factor the weight can be converted to a number. The value is displayed below the name in the lower display line. Several count factors can be selected. After selecting a number an other menu is displayed:

Count no name Set ♦Show ♦Print	Set : enter name and calibrate with sample (unload - load); Show : display setup for the number;	Print : single or all

5 COMMISSIONING WITH TERMINAL

One of the serial interfaces of PR1713, e.g. RS 232 Builtin, can be defined for the system console. The system console can be used for calibration, configuration and operation of PR1713.

5.1 System console: connecting menu structure

A terminal or a PC can be used as a system console. Conection to the buitin interface: see 3.3.3 "RS 232 Builtin interface" (an other interface is used in the same way). To use the terminal as operator device the following set up has to be made:

- Software Parameters "Operator Device on", select the intended interface (4.5.3.13)
- Setup Serial (4.5.2) for the interface: Protocol X-ON, Device ANSI, Echo Disabled, setting of interface as the terminal, e.g. 9600 Bd, 8 bits, 1 stop, no parity.

5.1.1 Connecting PR1713-PC

The PC is connected with a directly connected cable (Rx-Tx not crossed) to the configured (4.5.3.13) built-in RS 232 interface.

5.1.2 Terminal program

The terminal emulation program 'Hyper Terminal' provided by Windows is in the 'Accessories'. If this program is not available, proceed analogously with a comparable program.

Terminal programs of various manufacturers can be used for commissioning on many operating systems, provided that they behave like a VT100 (ANSI terminal) and can be adjusted to the required parameters. Adjust according to the interface configuration.

5.1.2.1 Adjusting the terminal emulation program

Start programm 'Hyper Terminal'. Enter 'Name:' in the 1st dialog window, button [OK].
Select 'direct connection via COM1' in the 2nd dialog window at 'connect via:', button [OK].
Select port COM2: (if the MOUSE is connected to COM1).
The 3rd dialog window is the registry card 'Data transmission'. Settings, button [OK].

Setting:

Bits per second:	9600
Data bits:	8
Parity:	none
Stop bits:	1
Protocol	XON/ XOFF

5.1.2.2 Switch-on messages

The terminal output after instrument switch-on is the Initialization message, followed by the Main screen: Instrument and version message, date/ time, main menu

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Main-Command-Level                  Mo 2

 C Configuration

 W Weighingpoint

 S Service
```

5.1.2.3 Terminate terminal emulation program

Before switching on the PC, or before closing the terminal emulation program, return to the main menu.

⇒ If the PC is switched off in a sub-menu instead of the main menu, the full mask may not be displayed when starting the terminal emulation program. In particular, information on the operating and editing functions are missing. Press space bar to display the mask at full size.

5.1.3 Main-Command-Level - menu structure

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Main-Command-Level                Mo xx.xxx xxxx 09:31:51


  C Configuration

  W Weighingpoint

  S Service

  P Prolog


  Q Quit
```

Access to the various input masks (survey, see Table of menu structure below) from this main menu (*Main-Command-Level*) is via sub-menus. Calling up the required sub-menus is by pressing the relevant key [C], [W], [S] or [P].

- Configuration *C Configuration*
- Weighing point *W Weighingpoint*
- Service *S Service*
- PROLOC *P Proloc*
- Leaving the main menu *Q Quit*

⇒ If a production is active in PR1713, the configuration is disabled:
Production is active, no configuration possible. Hit any key to continue
Press any key to remove this message from the display.

⇒ The entry of Q can be disabled. In this case, message: *Quit disabled* is displayed. By pressing any key, this message is removed from the display. Disable the entry [Q].

⇒ When using a PC with the Windows terminal program as a system console (terminal), returning to this main menu is not possible after entry of [Q]. For this, a cold start is required, i.e. all entered data are lost. When using a real terminal or a terminal program, e.g. Telix, returning to this main menu is by means of the [BREAK] key.

How and which parameters can be entered in the relevant sub-menus/ input masks is described in the following chapters.

5.1.3.1 Menu structure (tree structure)

With configuration on a serially connected terminal, the following set-up menu is valid:

Main menu	Configuration	Date	
		Time	
		Serial I/O	
		Licences	Enter
			Delete
			Print
		Software configuration	
		Fieldbus configuration	
		Entry of user-defined units	
		Print	
	Weighing point	Display	Calibration
			Additional weighing points
	Service	Show hardware configuration	
		Memory	
		Test modules	PR1713/04
			PR1713/06
			PR1713/12
			PR1713/13
		Show last error	
		Print (all configuration data)	
	Proloc		

The following sections and subsections are structured accordingly.

5.1.4 General operating notes

All the terms used in the masks are in English. In the description, the relevant *English expression* or display text is shown in a different font.

A submask can be left on several ways, which are displayed in the lower mask area, e.g.

E Exit	save and leave
Q Quit	leave immediately

Using the automatic repeat function of the keyboard can cause a crash of the **terminal emulation program**. Remedial action in case of trouble:

1. Close the **terminal emulation program** under Windows.
2. Open terminal emulation program under Windows.
3. Interrupt the PR1713 power supply shortly.

5.1.4.1 Editing functions in masks

In the lower mask area of some masks, the possible editing functions are displayed.

```
Previus / Next ....
+/- change parameter
Undo changes for ....
```

Editing functions

- Display of the previous/ next selection with the keys N or P
  Previous / Next ....

  Select input field by means of cursor keys [↑] and [↓]. [+] / [-]. Changing parameters
  + / - change parameter
  Selection is from 2 or more possible values

- *Undo changes for ....*

5.2 Configuration

Calling up mask *Configuration* is from the *Main-Command-Level*, by pressing key [C].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Configuration                          Mo xx.xxx xxxx 13:06:16

  D Set date
  T Set time
  C Change serial I/O parameter
  L Add, delete, show license
  S Set software configuration
  F Set fieldbus configuration
  U Set units

  P Print all configuration data
  E Exit
```

⇒ If a production in PR1713 is active, configuration is disabled:
Production is active, no configuration possible. Hit any key to continue
Press any key to remove this message from the display.

Function survey:

- Set date — *D Set date*
- Set time — *T Set time*
- Change serial interface parameters — *C Change serial I/O parameter*
- Add, delete and display licences — *L Add, delete, show license*
- Change and display software configuration — *S Set software configuration*
- Parameter of fieldbusoption PR1721/0x — *F Set fieldbus configuration*
- Entry of user-defined units — *U Set units*
- Print out all configuration data — *P Print all configuration data*

Calling up the required function is by actuating the relevant key.

- Leave menu Configuration — *E Exit*

Return to the main menu is by pressing key [E].

5.2.1 Set date

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Configuration                          Mo xx.xxx xxxx 13:06:16

  D Set date
  T Set time
......

Enter new date [31.05.1999]:
```

- Press key [D]
- Message: *Enter new date [31.05.99]: _* is displayed
- Enter the new date e.g.: *05.12.99*
- Press key [↵], the line is removed from the display if the entry was correct. With faulty entry, message: *(bad date) enter new date [31.05.99]: _* is displayed.
- Check against the header (top right)

5.2.2 Set time

```
     Configuration                              Mo xx.xxx xxxx 13:06:16

  D Set date
  T Set time
......

Enter new time [13:06:16]:
```

- Press key [T]
- The following message is displayed:
  Enter new time [13: 06:16]:
- Enter the new time e.g.: *13: 07: 00*
- Press key [↵], to remove the display.
- Check against the header (top right)

5.2.3 Serial interface configuration

Calling up serial interface configuration mask' *Change serial I/O parameter* is done from sub-menu *Configuration* by pressing key [C].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Serial I/O setup                       Mo xx.xxx xxxx 09:31:51

Slot         1: TTY2 (RS232)
Protocol      :X-ON
Baudrate      : 9600
Bits          :  8
Parity        :None
Stopbits      :  1
Slaveadr      : ---
Device        :ANSI
Echo          :Enabled
......
```

⇒ When calling up this mask, the communication is disabled.
In the upper mask area, the parameters of a serial interface (name and input field) are displayed and can be changed. The possible editing functions are displayed below.

- Save configuration *Exit and save*
  If changes were made, the system asks:
  Change modified I/O's? … sure ? Press [Y] or [N]

⇒ The changes are effective only after *Exit* ! The parameters for the serial interfaces are saved in EAROM.

♦ List of parameters and possible entries (selection):
- Selecting the serial interface: (*Serial IO*): *1, 2, … 7*
- Selecting the previous/next serial interface: *Previous / Next serial I/O*
- Protocol*: None, X-ON, EWCOM Slave V1, V2, V3, RTS/CTS, Remote Display, W&M Printer*
- Number of data bits (*Bits*): *7, 8*
- Parity check (*Parity): None, Odd, Even*
- Number of stop bits (*Stopbits): 1, 2*
- Transfer rate (*Baudrate*): *300, 600, 1200, 2400, 4800, 9600, 19.2.*

- PR1713 slave address *(Slave-adr): <space>, A to Z*
- Terminal type (Devicetyp): Raw-I/O, Ansi, VT52
- Echo (Echo): Disabled, Enabled

⇒ A PR1713 can be equipped with max. 7 serial interfaces. For a survey, see next chapter.

⇒ Dependent of selected protocol (and interface), defined default settings are made by the system.

5.2.3.1 Survey: physical interfaces

PR1713 can besides the built-in interface be equipped with max. 6 additional serial interfaces, provided that the 3 options sockets are fitted with 1713/04. The interface no. is allocated from TTY1 to TTY6 via software. All interfaces can use each protocol, but EWCOM, Remotedisplay and W&M printer only once per device.

The following settings are useful dependent of protocol. These settings can also be changed subsequently.

Possible protocols	Default settings: data bits, … echo	Application, example	Rem.
None			
X-ON	8, none, 1, 9600, -, ANSI, enabled	System console	1
EWCOM slave V1	7, even, 1, 9600, A	EW protocol V1	5, 6
EWCOM slave V2	8, even, 1, 19.2, A	EW protocol V2, PR1740	6
EWCOM slave V3	8, even, 1, 19.2, A	EW protocol V3, DDE-server	6, 7
RTS-CTS (or X-ON)	standard: as X-On	Printer	3
W&M printer	7, even, 1, 9600, -, raw I/O, disabled	W&M printer	2
Remotedisplay	7, even, 1, 9600, -, raw-I/O, disabled	PR16xx, remote display	4

Remarks:

1. A terminal or a PC with a terminal emulation program is used as system console.
2. An FX880/PH02 (Epson) printer permits W&M weight data print-out.
3. Via this protocol, print-out of all PR1713 configuration data and weight print-out during weighing point calibration (if necessary) are made.
4. PR1713 sends the remote display telegram successively for all 2 weighing point modules. This is followed by a pause of approx. 80 msec.
   Data contents: see PR1627 and PR1628 documentation.
5. Protocol for communication with PR16xx units
6. For operation with **PR1750.**
7. For operation with **PR1791** (DDE server).

5.2.4 Entry of the software licence number

Calling up mask *License configuration* is done from sub-menu ' *Configuration* by pressing key [L].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     License Configuration                Mo xx.xxx xxxx 09:31:51

                                          Boardnumber: 9131135

 A Add a License    PR1713/20 Enabled  Complex batching controller
                    PR1713/21 Disabled Multi recipe management
 D Delete a License PR1740/11 Disabled Production control and supervision
                    PR1740/21 Disabled Production plan
 P Print License    PR1740/31 Disabled DDE transfer
                    PR1740/41 Disabled PR1740 Remote control

......
```

- The board number is displayed below the header. The licence numbers to be entered must refer to this board number. Otherwise they are not accepted by the system.

- The status of all licences is displayed: *enabled* or *disabled*

- Editing function
  - *A Add a License*
  - *D Delete a License*
  - *P Print License*
  - *E Exit*

- After pressing the relevant key ([A] or [D]), the system prompts for entry of a licence number: *Enter License number: _*
  The system checks the licence number. Unless it is accepted by the system, message: *Not a License number* or: *Wrong License number* is displayed.

- If the licence number is unknown, delete the wrong licence number with the backspace key [←] and terminate the entry with [↵].

5.2.5 Entry of software parameters

Calling up mask *Set software configuration* is from sub-menu *Configuration* by pressing key [S].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Software Configuration               Mo xx.xxx xxxx 09:31:51

Language                      :English
Frontkey timeout              :2sec
Low battery                   :   on
Lines per recipe              : 30
Enable recipe simulation      :   on
Report to                     :communication
Frontkey    tare/untare       :enabled
            set zero          :enabled
Allow quit in mainlevel       :   on
Reset on stop + quit          :disabled
S88.01 Interface              :  off
......
```

5.2.5.1 List of parameters and possible entries

Language
Language for operator dialog Selecting the dialogue language for the operator (not for configuration): *English* (default) or *Local Language* (Default alternative language: German)

Frontkey timeout
Off, 1 sec, 2 sec, 3 sec
Gross and tare display holding time Holding time of PR1713 function keys

Low battery: *on, off , 1 min*
Battery monitoring display Alarm message with
The alarm message is output continuously with *on*,
not output with *off* , and with *1 min*, the alarm message is output once per minute during some seconds.
The alarm message is output on the left display: Lo bAt

Lines per recipe
Lines/ Recipe Maximum number of lines for recipes (*1*....*255*).

Enable recipe simulation on, off.
Recipe simulation Set recipe simulation on/ off.
For starting recipes with modified batching modules, recipe simulation can be switched off.

Report to
Report to Specify destination for batching reports, select with scroll keys for: *none*, *all* (PR1740) and Proloc (local printer), *communication* (PR1740), *Proloc* (local printer).

Frontkey
Function key disabling Several PR1713 function keys can be disabled for defined applications. *tare / untare*, and *set zero*: *Enabled*, *Disabled*.
Enabling/ disabling is always done for all PR1713 weighing points.

Allow quit in mainlevel
Allow quit in main level may be set to *on* or *off* .
'Allow quit in main level' should be on only if necessary: I.e. if serial interface SERIAL I/O 1 is used also for other purposes (by PROLOC programs) except for the system console (terminal/ terminal emulation).

Reset on stop + quit
Stop + Quit After pressing keys 'Stop' and 'Quit' for *1sec* or *5sec* during operation, the boot menu is displayed.
Reset switched off: *disabled*.

S88.01 Interface
Inbatch mode *: on* Unit is used with InBatch.
off Unit at PR1740 or stand-alone.

5.2.6 Fieldbus parameter

Calling up mask *Set fieldbus configuration* is from sub-menu *Configuration* by pressing key [F].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Fieldbus Configuration

PR1721 protocol              :Profibus-DP
IBS cycle                    : ---
Profibus DP slave adress     : 1
DeviceNet baudrate           : ---
DeviceNet node adress        : ---
Scale mode                   :Enabled
......
```

Configuration for the fieldbus unit PR1721/xx
None, Interbus-S, Profibus-DP, Devicenet
1 50
1 126
500k, 256k, 125k
1 62
Disabled, Enabled

Select a field by means of cursor keys [↑] and [↓]. Changing parameters by the keys [+] / [-].
If the PR1721 module is inserted in the unit, values are selectable. Dependent of selection, other parameters are required. After parameter entry, PR1713 makes a warm start, in order to initialize the PR1721 module in the unit.

Interbus-S	The value (*1 ... 50*) at *IBS cycle:* indicates the actualization interval. Calculate the value by: 66,7 + number of bytes + 0.3 x number of slaves.
Profibus-DP	Enter the address (*1 ... 126*) for Profibus-DP at *Profibus DP slave address:*
Devicenet	For *Devicenet* select the baudrate and enter the *DeviceNet node adress* (1 ... 60, also known as MAC-ID).
Scale mode	*Enabled* activates the standard-interface between scale and fieldbus.

5.2.7 Entry of user-defined units

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Configuration                        Mo xx.xxx xxxx 13:06:16

  .....
  U Set units

  P Print all configuration data
  E Exit

Enter new units : u1u2u3u4u5u6u7u8
```

For use by PROLOC firmware functions MAKE_WEIGHT and SET_WEIGHT_UNIT, 8 different units can be defined. Each unit is composed of 2 characters.
Entry/ modification of the 8 user-defined units:

- Press key [U]
- A string (16 characters) of the 8 actual units á 2 characters is displayed:
  Enter new units: u1u2u3u4u5u6u7u8
  The cursor is behind the 16th character.
- Move cursor with arrow keys, delete characters with the backspace key [←] (line editor).
- Entry of required characters (units).
- Press the Enter key [↵]. If the entry is correct, the line is removed from the display. If the entry is faulty, the following message *(must be 16 characters): lbcmdm* and the characters entered so far are displayed.

5.2.8 Printing all configuration data

All parameters are printed out via the serial interface configured for the printer previously.

5.3 Weighing point mask

Calling up mask *Weighingpoint* is done from the *Main Command Level* by pressing key [W].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Weighingpoint                          Mo xx.xxx xxxx 09:31:51

A < > N     005.4kg


B < > B     033.3kg


 Keypad
0 Set Zero I/O Tare In/Out
Select Display T Tare G Gross N Net ? Test F Flow Z Zeroset D Diff S Setp
P Print C Calibration A Additional WP's E Exit
```

- The functions of this mask are:
  - Weight display and function keys for the PR1713 weighing points
  - Calling up sub-menus/ masks:
    Weighing point calibration mask *Calibration*
    Additional weighing points *Additional WP's*

- Return to the main menu is with [E] ***E*** *Exit.*

- Weight display and function keys for the PR1713 weighing points.

- Weighing point selection is by means of the two cursor keys [↑] and [↓]. The actually selected weighing point is highlighted by inverse display.

The weight values of 2 weighing points can be displayed in the weighing point mask. If more weighing points are defined in PR1713, scrolling through the display field can be done using the cursor keys [↑] [↓].

⇒ The function keys relate to the instantaneously selected weighing point.

Mask description.

- Gross/ net/ tare weight display *B/N/T Select Display*
  The gross, net or tare weight can be displayed by pressing the relevant key with the scale tared. This is shown by display of the relevant letter.
- Setting the zero is done with key [0] *Set Zero*
  When the scale was set to zero, **< 0 >** is displayed in front of the weight.
- Setting or deleting the tare memory is done with keys [I] or [O] *I/O Tare In/Out*
- Press key [?] to carry out the analog test *? Test*. Test value and reply line *Toggle Testmode Status OK* instead of the weight is displayed. Pressing key [?] once more displays the previous value again.
- Pressing key [P] *Print* prints out the weight values (on configured printer).
- Description of the weighing point calibration mask.
- Calling up mask *Additional WP's.* Calling up is done by pressing key [A]. If a production is running, this call is disabled, message: *Production is active, no configuration possible*

5.4 Weighing point parameters: storing, saving, protecting

This chapter describes how to store, save and protect the weighing point parameters. The individual weighing point parameters, entry, weighing point configuration and weighing point calibration are described in the two following sub-sections.

5.4.1 Access protection: CAL switch

The weighing point parameters are protected against unauthorized/ accidental access by the CAL-switch (S.I.L. switch in the analog part, calibration protection). Evaluation of the switch position is when calling up mask 'Calibration':

⇒ CAL switch in open position: access permitted

- When calling up mask 'Calibration', the access is permitted, i.e. the weighing point can be configured and calibrated. In addition to the actual weighing point parameters, mask 'Calibration' indicates the access functions which are enabled now (see figure on the next page).

⇒ CAL switch in closed position: weighing point parameters protected, no download and flash

♦ When switching on the PR1713/00

- the calibration saved in the EAROM (only with valid calibration data) is loaded.
- otherwise, factory setting and factory calibration are loaded.

♦ When calling up mask 'Calibration', the weighing point parameters are protected. The weighing point parameters are only displayed in mask 'Calibration'.

♦ With W&M weighing systems, this CAL switch is sealed in compliance with the calibration standards.

5.4.1.1 Calling up and display of the weighing point calibration mask

♦ Calling up weighing point calibration mask *CALIBRATION*

- Weighing point selection is by means of the two cursor keys [↑] and [↓]. The actually selected weighing point is highlighted by inverse display.

- Calling up the weighing point calibration mask is done by pressing key [C] *Calibration.* If a production is running, this call is disabled, message: *WP is in use*

  ⇒ When calling up mask 'Calibration' with the CAL switch open, tare memory and zero setting memory are erased. Moreover, the following functions are disabled during weighing point calibration: test, automatic zero tracking, taring and zero setting

♦ The weighing point calibration mask is shown below

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     CALIBRATION                              Mo xx.xxx xxxx 09:31:51
    033.323
A < >        033.3kg

 Configuration
Analog Filter:  off  Meastime  : 2.00 Standst.rn:  1.00 d  Overload  :    9 d
Digital Filter: off  Fcut      : 1.00 Zeroset.rn: 50.00 d  no p below:   50 d
Multirngmd:     off  Standst.ti:  0   Zerotrk.rn:  0.25 d  Stepwidth :    1
Test mode :Absolute  Zerotrk.ti:  0   Zerotrk.st:  0.25 d  Multirang1: 3000 d
W and M   :Disabled  Tare timot:  8                        Multirang2: 6000 d
 Current calibration
Fullscale:    600.0kg Deadload :-0.027408 mV/V   Resolution:  8.774623 cd/c
Calipoint:---fixed--- Span     : +0.889043 mV/V  Resolution:     11.39 c/d
 Keypad
Select item with cursor up/down/left/right Change with +/-
Return to fiXed,Set Fullscale,Calibrate by Weight or Millivolts
E Exit calibration
```

The weighing point calibration mask contains all weighing point parameters. They are classified as follows:

♦ Configuration parameter *Configuration*:
During configuration, the parameters which are not included into conversion of measured counts into a weight value are determined for operation of the analog part.

♦ Calibration parameters *Current calibration.* During calibration, the conversion of the analog input signal (or digital: of measured counts) into the weight value is determined.

The access functions (*Keypad*) are displayed below these two weighing point parameter groups.

5.4.1.2 Leaving the weighing point calibration mask

When leaving the mask, decision what shall be done with the entered weighing point parameters must be made. Leaving the mask is always started with command

- *Exit calibration* : enter letter E

Now, the system offers the following reactions (see below line *Keypad* in the figure):

```
 Keypad
S Save N Dont Save Q Quit calibration C Stay on calibration
```

These are:

• Saving in EAROM:	*Save*	Enter letter S
• Use data, no saving:	*Dont save*	Enter letter N
• Quit calibration without saving the entries/ data:	*Quit calibration*	Enter letter Q
• Staying in the mask:	*Stay in calibration*	Enter letter C

When leaving the weighing point calibration mask with Q (*Quit calibration*), all entered weighing point parameters are overwritten with the previously (temporarily) saved weighing point parameters. The two functions 'Save' and 'Dont save' (in EAROM)' are described on the following page.

- After leaving the weighing point calibration mask, return is to sub-menu 'Weighingpoint'.

5.4.2 Saving the weighing point parameters in EAROM

After configuration and calibration of a weighing point, all relevant weighing point parameters can be saved in a non-volatile EAROM.

Saving of the weighing point parameters in EAROM is from mask 'Calibration' (only possible with switch CAL open):

- For finishing the calibration: *Exit calibration* Enter letter E
- From the reactions offered by the system, select saving in EAROM: *Save:* Enter letter S. The data are saved in the EAROM.
- For saving, the two steps must always be carried out.

5.4.3 Saving the weighing point parameters temporarily

When interrupting the configuration/ calibration, the new data which were entered can be saved. The relevant weighing point may already work with these parameters. Nevertheless, they are not saved in EAROM so far.

With power failure, these temporarily saved weighing point parameters are lost. With power recovery, the weighing point parameters saved in EAROM are used automatically.

Saving the weighing point parameters temporarily is done from mask 'Calibration' (only possible with switch CAL open):

- Terminate calibration *Exit calibration*: enter letter E

From the reactions offered by the system, select:

- *Dont save*: Enter letter N for using data temporarily

5.5 Weighing point configuration

The editing functions for parameter entry are described in the first sub-section, the individual parameters are described in the following sub-sections.

- For entry/ modification of weighing point parameters, switch CAL must be open.

5.5.1 Editing functions for parameter entry

- Weighing point selection
  Weighing point selection is before calling up this weighing point calibration mask by means of the two cursor keys [↑] and [↓]. The actually selected weighing point is highlighted by inverse display.

- Command lines
  The weighing point calibration mask is displayed with different command line dependent of the CAL switch position.

  - Command line: weighing point parameters protected

```
Keypad
E Exit display  Cal - Jumper closed
```

    A note that the CAL switch is closed is displayed (*Cal-Jumper closed*). I.e. the data can be displayed without changing them. The mask can be left by pressing key [E] (*E Exit display*).

  - Command line: access permitted

```
Keypad
Select item with cursor up / down / left / right Change with + / -
Return to FiXed, Set Fullscale, Calibrate by Weight or Millivolts
E Exit calibration
```

1. The commands for entry of the weighing point parameters are displayed in the first line:
   Select item with cursor up/down/left/right Change with +/-
   See items 'Select item' and 'Enter/change parameters'.

2. The second line refers to weighing point calibration.

3. The last line contains the command for leaving the mask
   E Exit calibration.
   See previous sub-section 'Exit calibration'.

♦ Item selection

Item selection is with the four cursor keys [←], [→], [↑] and [↓] (*Select item with cursor up/down/left/right*). The selected item is displayed inversely.

♦ Parameter entry/ changing

The entry/ change is dependent of the item. The two types of entry/ change are:

- Selection item: selection of predefined parameters is with keys [+] and [-]
  Selection fields are: *Filter, Testmode* and *Stepwidth*. All other fields are normal input items. Nevertheless, they can be changed with keys [+] and [-].

- Input item: entry of required parameter value.
  During entry, the values are shifted from right to left. Point or comma are part of the mask (cannot be entered). During entry, the content of the item is underlined. The entry can always be canceled by pressing the space key [_]. The old value remains unchanged.
  The parameter entry is completed with key Enter [↵]. Subsequently, the entry is checked:
  If an entry is within the permitted range, the value is stored and not underlined any more.
  If an entry is not within the permitted range, the entered value is replaced by the next permitted value and remains underlined.
  The operator has the following possibilities: Press key Enter [↵] to confirm this next value. Enter a new value. Redisplay the old value by pressing the space bar [_].

5.5.2 Filter: *Analog Filter*

Select between Filter (2 Hz) or no filter.

Digital Filter

Select between Bessel filter, aperiodic filter or no filter. With digital filter enter the cutoff frequency (`Fcut` 0,1 ... 5,00 Hz). The measuring time is fixed to 50 ms.

- After changing of the filter parameters, the maximum accuracy should be reestablished by re-calibration.

5.5.3 Analog test mode: *Testmode*

Determination, if the test measurement displays the deviation related to *FullScale* (absolute) or to *0* (relative) is made.

Calibration (with/ without weights) is completed with a test measurement and the result is scaled so that FullScale is displayed.
This value is displayed when pressing the function key [Test].

5.5.4 Measuring time: *Meastime*

Measuring time in ms, enter 50 or 100 ... 2000 (multiples of 100).

5.5.5 Standstill detection

The PR1713 standstill detection requires the two following parameters to determine the mechanical standstill of the scale. During a defined period of time (standstill time), the weight value of the scale must be within defined limits (the standstill range). In this case, the scale is in standstill condition.

Standstill range: *Standst.rn*

Permissible range 0.00d to 10.00d.

Standstill time: *Standst.ti*

Entry 'Number of measuring times', permissible range 1 … 8.

5.5.6 Zero set range: *Zeroset.rn*

Definition of a +/- range around the calibration zero, within which

- the displayed gross weight can be set to zero by pressing the zero setting key (or by a corresponding external command), or
- automatic zero tracking is active

Permissible range: 0.00d to 500.00d

5.5.7 Automatic zero tracking

In case of change of the empty scale (hopper weight) e.g. due to loss (tare reduction) or formation of slag (tare increase) by only a very low amount, automatic zero tracking ensures that the scale is reset to zero automatically.

Automatic zero tracking is defined with the following parameters. With the scale in standstill condition and the gross weight within the zero set range, automatic zero tracking is stepwisely (step width) at defined intervals.

5.5.8 Automatic zero correction switch-on/off

Switch-on:	interval > 0	(*Zerotrk.ti > 0*)
Switch-off:	interval = 0	(*Zerotrk.ti = 0*)

5.5.9 Zero tracking range: *Zerotrk.rn*

Permissible range 0.00d to 500.00d.

5.5.10 Zero tracking stepwidth: *Zerotrk.st*

Permissible range 0.00d to 10.00d

- For W&M applications, the correction must not be above 0.5 d/sek.
- The automatic zero tracking stepwidth should be smaller than the standstill range also with non W&M applications.

5.5.11 Zero tracking interval: *Zerotrk.ti*

Entry is in measuring times, permissible range 0 (= off) to 100

- Switching off the automatic zero tracking is by setting Zerotrk.ti = 0.

5.5.12 Multirange scale

The multirange function is controlled by three parameters in the calibration. With *Multirange mode= on* the scale has three ranges with different resolution: the change-over limits *Multirange limit 1* and *Multirange limit 2* represents the range border. If the gross weight has more d as the relevant change-over limit, the next (wider) stepwidth is used (1->2->5->10->20->50).
If the gross weight is <= 0.25 d of the lowest range, the scale in standstill and untared condition, the scale will be switched back to the lowest range.
During Calibration the multirange function is principally switched off.

5.5.13 Tare time-out: *Tare timot*

Unless the tare command can be executed within time n (n = number of measuring times), e.g. because the scale was not in standstill condition, the weighing point module generates a message (e.g. no standstill noStAnd).

5.5.14 Maximum permissible overload: *Overload*

Entry is in d, permissible range 0d to 9999999d

5.5.15 Min. weight limit for print-out: *no p below*

Entry in p, permissible range 0d to 9999999d

5.5.16 Stepwidth (scale divisions): *Stepwidth*

Step widths: 1, 2, 5, 10, 20, 50

5.5.17 W&M mode: *W & M*

W&M mode	*Enabled*
non W&M mode:	*Disabled*

5.6 Weighing point calibration

During calibration, the relationship of display and measured variable (weight) is determined.
This relation is determined by the two entries

- Deadload (weight of the empty scale *Deadload*) and
- Scale measuring range (*Span*).

During calibration, these two parameters are determined by

- a physical weighing operation/ weighing point calibration with weights or by
- entry of the equivalent input voltage in mV/V or weighing point calibration without weights.

⇒ When calling up mask 'weighing point calibration' with the CAL switch open, tare memory and zero set memory are erased. Moreover, the following functions are disabled during weighing point calibration: Test, automatic zero tracking, taring and zero setting.

5.6.1 Weighing point calibration parameters

The weighing point calibration parameters are described below. The entries and the corresponding error messages are described in the following sub-sections.

FullScale: ***Fullscale***

The full scale value determines the maximum weight which can be measured. Permissible entries are within the limits of the full scale value:

overall weight range
within 0.1 00 and 99999 00
in g, kg, t or lb.

The value must be divisible by the step width and must have max. 3 digits behind the decimal point.

Calibration weight: ***Calipoint***

This is the value of the

calibration weight	weighing point calibration with weights or the
theoretical calibration weight	weighing point calibration without weights

Deadload: ***Deadload***

The value of the scale after discharge, the scale deadload. The input voltage equivalent to this weight value is displayed/ stored in mV/V.

Span: ***Span***

- The span is determined by calibration by means of weights or
- must be entered during calibration without weights.

The span indicates the equivalent input voltage in mV/V related to the scale f.s.d. (full scale):

$$span\ [mV/V] = \frac{full\ scale \cdot load\ cell\ sensitivity\ C\ [mV/V]}{load\ cell\ capacity\ (sum\ of\ all\ load\ cells)}$$

Span in [mV/V]
Full scale as a weight value
Load cell sensitivity C [mV/V]
Load cell capacity (= sum of all load cells) as a weight value

Resolution c/d: ***Resolution c/d***

The resolution c/d indicates the number of internal counts (= result of analog conversion) related to the stepwidth (= smallest division d, by which the display value can change).
This value should be as high a possible related to 1.

Resolution cd/c: ***Resolution cd/c***

The resolution cd/d is the inverse value of resolution c/d multiplied by 100 (cd, Centi-d =one hundredth of a display step).

5.6.2 Editing functions for parameter entry

♦ Weighing point selection

Weighing point selection is before calling up this weighing point calibration mask (see above): Weighing point selection is by means of the two cursor keys [↑] and [↓]. Thereby, the actually selected weighing point is highlighted by inverse display.

♦ Item selection

Direct access is only to item *Fullscale*. Item selection is by entry of a letter (unlike the cursor keys as for weighing point configuration parameters). Parameters *Resolution* are not accessible (only used for informative purposes).

♦ Entry/ change of parameter

- Enter the required parameter value: value and + dimension

- Change the entry by overwriting (select character with the cursor keys). Delete by pressing the backspace key [←] and re-enter.
- Press the enter key [↵] to complete the entry.
- Subsequently, the entry is checked.

5.6.3 Adjusting the full scale value: *Fullscale*

Enter the full scale value into item *Fullscale*.

♦ Open the entry dialogue by entry of letter 'F'.

♦ Prompt for entry of the measurement value: *Enter new fullscale [3000kg], E to exit*: The old measuring range with dimension is displayed [in square brackets] (default value: *3000 kg*). PR1713 expects the following entries:
- Measuring range with comma (or point)
- no or one or several spaces
- dimension (g, kg or t)

Complete by pressing the enter key [↵].

♦ PR1713 checks the entry for plausibility:
If the entered full scale is smaller than the calibration weight specified during calibration (*Calipoint*) or if the calculated input voltage for the specified full scale is out of the permissible limits, the new full scale value is rejected. The full scale is rejected, if less than 0.8 counts/d are provided.

- If the entry is accepted, the following message is displayed during approx. 1 sec: *Status OK*
- Possible error messages:

Bad Weight	e.g. dimension missing
Status Arithmetik overflow	e.g. weight value too high
Status Above phymax	calculated input voltage: > 36 mV
Too many d	resolution too low: < 0,8 c/d
Status Below Cal	value below calibration point
Illegal Fullscale	the last two digits are unequal to 00 or have more than 3 digits behind the decimal point

♦ Leave input item without changing the old measurement value (with operator error):

- If necessary, delete entries: position the cursor in the leftmost position with the cursor key [←]. Delete all entries with the delete key [Del].
- Enter key [↵]: The old span remains unchanged.

⇒ Adjusting the stepwidth (divisions): *Stepwidth*

5.6.4 Default span

Use the default span value:
Return to FiXed or *X to set fixed span*
Press key [X] for taking over the default span. To avoid operator errors, the displayed prompt must be replied with YES/ NO [*Y/N]*.

5.6.5 Weighing point calibration procedure/sequence

Weighing point calibration (or recalibration) is as follows:
1. Load default values (with [X] if required).
2. Allow the unit to warm up (min. 60 minutes).

3. CAL switch open: weighing point parameter access enabled
4. Call up the calibration mask of the relevant weighing point.
5. Enter the weighing point configuration parameters.
   Check/ change (default) parameter *Filter*
   - With subsequent modification of this parameter, recalibration is recommendable. All other weighing point parameters can also be changed subsequently.
6. Determine the full scale: *Fullscale*
7. Select the calibration mode

Keypad
Select item with cursor **up** /**down** / **left** / **right** Change with + / **-** Return to Fi**X**ed, set **F**ullscale, Calibrate by **W**eight or **M**illivolts **E** Exit calibration

   Weighing point calibration with weights *Calibrate by Weight*: Press key [W].
   Weighing point calibration without weights *or Millivolts*: Press key [M].
8. Realize weighing point calibration
9. Store the weighing point parameters temporarily or save them in EAROM.
10. CAL-switch closed: weighing point parameters protected

⇒ The internal CAL switch for the built-in WP is open (and normally remains open)

5.6.6 Weighing point calibration with weights

The two methods of weighing point calibration with weights are:

- If a calibration weight corresponding roughly to (or smaller than) the full scale can be placed on the scale, calibration in one step is possible.
- If only a relatively small calibration weight (e.g. 10% of the full scale) can be placed on the scale, step-by-step calibration is required.

⇒ The calibration weight should be a high as possible, otherwise, the error is too high.

5.6.6.1 Calibration in one step with weights

Proceed as described in points 1. to 7. of the 'Weighing point calibration procedure'. This is followed by the actual calibration:

1. Command line zero *Unload* in the calibration mask

Calibration by weight
Unload and hit **O** or **S** to skip, **Q** to quit, **E** to end, **X** to set fixed span, **P** to print

   The system offers the following replies:

Unload and hit 0	unload the scale and set the zero
S to skip	skip zero setting
Q to quit	leave the calibration without doing anything
E to end	calibrate and finish
X to set fixed span	set the fixed span
P to Print	print out the weight value

2. Set the zero
   Unload the scale, press key [0].
   - PR1713 evaluates the data. The command line of the weighing point calibration mask is:

   Setting deadloads … the system stores the data. This is followed by:
   Setting deadloads … Status OK message is displayed during approx. 2 seconds
   - The following weight value is displayed: *0000 kg*

   Repeat zero setting in case of error. See section 3 and 5

3. The following command line is displayed in the mask: *Unload/Load*

```
Calibration by weight
Unload and hit O or S to skip,
E to end, X to set fixed span, P to print
```

The system offers the following replies:

Unload and hit 0	unload the scale and set the zero
Load and hit Return	load the scale and set the span
E to End	finish the calibration
X to set fixed span	set the fixed span
P to print	print out the calibration parameters

4. Calibrating the weighing point
   1. Place the calibration weights on the scale (if possible = full scale)
   2. Press enter key [↵]
      The following line is displayed in the weighing point calibration mask:
      Enter calibration point [6000kg], E to exit:
      The full scale is proposed as calibration weight.
   3. Enter the calibration weight
      Weight value with comma (or point), as applicable
      - no or one or several spaces
      - dimension (g, kg or t)
      - Press the enter key to complete [↵]
      The following command line is displayed in the weighing point calibration mask:
      Enter calibration point [6000kg], E to exit: 4000 kg
      If the values are within the permitted range, the following message is displayed after a few seconds:
      Setting unit … Status OK
      Setting weight … Status OK Message is displayed during approx. 2 sec.
      Possible error messages:
      Setting weight … Bad Weight e.g. dimension missing
      Setting weight … Status Above Scale specified weight to high
      Setting weight … Status Above phymax input voltage > 36 mV

5. The command line as shown in point 3. is displayed: *Unload/Load*

```
Calibration by weight
Unload and hit O or S to skip,
E to end, X to set fixed span, P to print
```

- Repeat the calibration step (as shown in section 4.).
  Apply the calibration weight *Load and hit Return*
  Press the Enter key [↵] (see 4.)
- Set the fixed span *X to set fixed span*
  If the calibration cannot be finished correctly for any reason, press key [X]. To avoid operator errors, a prompt is displayed and must be replied with Yes/ No: *[Y/N]*.
  The system executes the command. Subsequently, the command line as shown in point 5 is displayed again.
- Print the actual weight: *P to Print*
  Press key [P]. The system executes the command. Subsequently, the command line as shown in point 5 is displayed again.
- Set the zero *Unload and hit O*
  If necessary, zero setting (as described in point 2.) can be repeated.
- Finish calibration *E to End*
  Press key [E]
  Calculating test … the system calculates the test value
  Calculating test … Status OK

Subsequently, the standard command line is displayed:

```
Keypad
Select item with cursor up / down / left / right Change with + / -
Return to FiXed, Set Fullscale, Calibrate by Weight or Millivolts
E Exit calibration
```

Calibration is finished. The data must be saved: Proceed as described in points 9. and 10. of the 'Weighing point calibration procedure'.

5.6.6.2 Step-by-step calibration

Description

If the scale can only be loaded with a relatively low calibration weight (e.g. 10% of full scale), step-by-step calibration is required. The steps are:

- ♦ Step-0: tare
- ♦ Step-1 : calibrate with maximum possible calibration weight
  - Calibrate with the maximum possible calibration weight
  - 2. Print out the calibration data

⇒ This calibration must be done particularly carefully, because any error will repeat itself (will be added) with all following steps.

- ♦ Step-2: Calibrate with 1* substitute weight + calibration weight (= 2 * calibration weight)
  - Replace calibration weight by substitute weight:
    Load the scale with a substitute weight instead of the calibration weight. If e.g. a weight hopper is concerned, water must be filled in, until the substitute weight corresponds exactly to the calibration weight. To reach this value as exactly as possible, the weight with the higher internal resolution (2 additional digits) is displayed above the large weight value in the weighing point calibration mask. Print out the calibration data.

⇒ Note: The weighing point was already calibrated, but for a smaller range.

- ♦ Step-3: Calibrate with 2* substitute weight + calibration weight (= 3 * calibration weight)
  - Replace calibration weight by substitute weight.
  - Print out calibration data
- ♦ Step-n: calibrate with (n-1)* substitute weight + calibration weight (= n * calibration weight)
  - Replace the calibration weight by substitute weight.
  - Print out calibration data
- ♦ The max. number of steps is determined by: n * calibration weight ≤ full scale. Step-0 and step-1 correspond to 'Calibration in one step'. Step-2 to step-n are only repetitions of points 4. and 5. of the 'Calibration in one step'.

Step-by-step calibration

Proceed as described in points 1. to 7. of 'Weighing point calibration procedure'. This is followed by actual calibration:

1. The command line displayed in the calibration mask is *Unload*

```
Calibration by weight
Unload and hit O or S to skip,
Q to quit, E to end, X to set fixed span, P to print
```

The system offers the following replies:

Unload and hit 0	unload the scale and set the zero
S to skip	skip zero setting
Q to quit	cancel calibration without doing anything
E to end	calibrate and finish
X to set fixed span	set the fixed span
P to Print	print out the weight value

2. Set the zero
   - Unload the scale (discharge)
   - Press key [0].
   - PR1713 evaluates the data. Now, the following command line is displayed in the weighing point calibration mask:
     Setting deadloads … system saves the data. Subsequently:
     Setting deadloads … Status OK the message is displayed during approx. 2 seconds
   - Weight display goes to: *0000 kg*
   - In case of error, repeat zero setting. See point 3 and 5

3. The following command line is displayed in the mask: *Unload / Load*

```
Calibration by weight
Unload and hit O or S to skip,
Q to quit, E to end, X to set fixed span, P to print
```

The system offers the following replies:

Unload and hit 0	unload the scale and set the zero
Load and hit Return	load the scale and determine the span
E to End	finish calibration
X to set fixed span	set the fixed span
P to print	print out the calibration parameters

4. Calibrate the weighing point
   Apply the calibration weight (if possible = full scale)
   - Press the Enter key [↵]
   - The following command line is displayed in the weighing point calibration mask:
     Enter calibration point [6000kg], E to exit
   - The full scale is proposed as calibration weight.
   - Enter the calibration weight:
     - Weight value with comma (or point) as required
     - no or one or several spaces
     - dimension (g, kg or t)
     - complete by pressing the Enter key [↵]
     - dimension (g, kg or t)
     - press the enter key [↵] to complete the entry
   - Possible error messages:
     Setting weight … Bad Weight e.g. dimension is missing
     Setting weight … Status Above Scale weight value too high
     Setting weight … Status Above phymax input voltage > 36 mV

5. The command line as shown in point 3. is displayed *Unload / Load*

```
Calibration by weight
Unload and hit O or S to skip,
E to end, X to set fixed span, P to print
```

Calibration step-2 to -n: repeat weighing point calibration 1 to (n-1):
1. Replace calibration weight by substitute weight *Load and hit Return*
2. Press the Enter key [↵] and return to point 4
Caution: calibration weight = enter total substitute weights + calibration weight

- In case of error, repeat calibration step (as described in point 4.).
  1. Apply the calibration weights *Load and hit Return*
  2. Press the Enter key [↵] (see 4.)
- Set fixed span *X to set fixed span*

If the calibration cannot be finished correctly for any reason: press key [X]. To avoid operator errors, a prompt is displayed, which must be replied with Yes/ No: *[Y/N]*.
Y means: restart step-by-step calibration ! The system executes the command. Subsequently, the command line shown in point 5 is displayed again.

- Print out actual weight *P to Print*
  Press key [P]
  The system executes the command. Subsequently, the command line as shown in point 5. is displayed again.

- Set the zero *Unload and hit O*
  If necessary, zero setting (as described in point 2.) can be repeated.

- Finish calibration *E to End*
  Press key [E]
  Calculating test … System calculates the test value
  Calculating test … Status OK
  Subsequently, the standard command line is displayed:

```
Keypad
Select item with cursor up / down / left / right Change with + / -
Return to FiXed, Set Fullscale, Calibrate by Weight or Millivolts
E Exit calibration
```

Calibration is finished. The data must be saved: Proceed as described in points 9. and 10. of the 'Weighing point calibration procedure'.

5.6.6.3 Subsequent zero correction

Description

If the hopper weight changes e.g. due to loss (tare reduction) or slag (tare increase) by an amount which is higher than the zero set range, the automatic zero tracking and manual zero setting will not function any more. In these cases, subsequent zero correction is possible, without recalibrating the weighing point.

For this, call up the weighing point calibration and set only the deadload. Calibration must be skipped.

Zero correction

Proceed as described in points 1. to 7. of the 'Weighing point calibration procedure'. This is followed by actual calibration: zero correction:

1. The following command line is displayed in the calibration mask: *Unload*

```
Calibration by weight
Unload and hit O or S to skip,
Q to quit, E to end, X to set fixed span, P to print
```

The system offers the following replies:

Unload and hit 0	unload scale, set the zero
S to skip	skip zero setting
Q to quit	leave the calibration without doing anything
E to end	calibrate and finish
X to set fixed span	set the fixed span
P to Print	print out the weight

2. Set the zero
   - 1. Unload the scale
   - 2. Press key [0]
   - PR1713 evaluates the data.
     Now, the following command line is displayed in the weighing point calibration mask:

Setting deadloads … *s*ystem saves the data, subsequently:

Setting deadloads … Status OK message is displayed during approx. 2 seconds. The weight display goes to: 0000 kg

- In case of error, repeat zero setting. See point 3

3. The following command line is displayed in the mask: Unload/ Load

```
Calibration by weight
Unload and hit 0 or S to skip,
E to end, X to set fixed span, P to print
```

The system offers the following replies:

Unload and hit 0	unload scale, set the zero
Load and hit Return	load the scale, set the span
E to End	finish calibration
X to set fixed span	set the fixed span
P to print	print out the calibration parameters

4. Set only the zero = finish calibration *E to End*
   Press key [E]
   Calculating test … system calculates the test value
   Calculating test … Status OK
   Now, the following command line is displayed:

```
Keypad
Select item with cursor up / down / left / right Change with + / -
Return to FiXed, Set fullscale, Calibrate by Weight or Millivolts
E Exit calibration
```

Subsequent zero correction is finished. The data must be saved: proceed as described in points 9. and 10. of the 'Weighing point calibration procedure'.

5.6.7 Weighing point calibration without weights

If the scale to be calibrated is not subject to the calibration law and if calibration with weights is not possible or not required for reasons of accuracy, weighing point calibration without weights is possible.

As a prerequisite, however, the load cell sensitivity (if possible, the sensitivity of each load cell) must be known.

This information can be used to calculate the span.

- Calculation of the load cell sensitivity

If the sensitivity C of the individual load cells 1 to n is different, the mean load cell sensitivity C_{Avr} is calculated as follows:

$$C_{Avr} = R_{aAvr}\left(\frac{C_1}{R_{a1}} + \frac{C_s}{R_{a2}} + \ \ldots\ + \frac{C_n}{R_{an}}\right)$$

Thereby, Ra is the load cell output resistance. The following formula is applicable to the mean output resistance RaAvr:

$$RaAvr = \frac{1}{n}\sum Ra$$

The formula is simplified, if load cell sensitivity C and output resistance Ra are almost equal for all load cells.

$$CAvr = \frac{1}{n}\sum C$$

Span: Calculation of equivalent input voltage in mV/V

The span indicates the equivalent input voltage in mV/V related to the full scale. It is calculated as follows:

$$\text{span [mV / V]} = \frac{\text{full scale} \cdot \text{load cell sensitivity C [mV / V]}}{\text{load cell capacity (sum of all load cells)}}$$

- Deadload: calculation of the equivalent input voltage in mV/V

The input voltage equivalent to the deadload in mV/V is calculated as follows:

$$\text{deadload [mV / V]} = \frac{\text{deadload (weight)} \cdot \text{load cell sensitivity C [mV / V]}}{\text{full scale}}$$

Unless the deadload is known from the very beginning, it must be estimated, and this estimation must be used to calculate the deadload in mV/V. The subsequent zero correction can be used to redetermine the

⇒ deadload subsequently (hopper is empty). See 'Subsequent zero correction' in 'Weighing point calibration with weights.'

5.6.7.1 Calibration without weights

Proceed as described in points 1. to 7. of the 'Weighing point calibration procedure'. This is followed by the actual calibration:

1. The following command line is displayed in the calibration mask: *Deadload*

```
Calibration by mV/V
Enter deadload mV/V, Q to quit, S to skip: _
```

Enter deadload mV/V	enter deadload in mV/V
Q to Quit	+ press Enter [↵] and quit without doing anything
S to Skip	+ press Enter [↵] and skip the tare entry

2. Enter the deadload in mV/V
   - Enter the deadload with comma (or point)
   - Complete by pressing the Enter key [↵]
   - PR1713 evaluates the data.
     Now, the following command line is displayed in the weighing point calibration mask:
     Setting deadloads … system saves the data, subsequently:
     Setting deadloads … Status OK message is displayed during approx. 2 s
   - The weight display does not change.
3. The following command line is displayed in the calibration mask: Span

```
Calibration by mV/V
Enter span mV/V, E to exit: _
```

Enter span mV/V	Enter the span in mV/V
E to Exit	+ Enter key [↵] no entry/ terminate calibration

4. Enter the span in mV/V
   - Enter the span with comma (or point)
   - Finish the entry by pressing the enter key [↵].
   - PR1713 evaluates the data.
     Now, the following command line is displayed in the weighing point calibration mask:
     Setting span … the system saves the data. subsequently:
     Setting span … Status OK the message is displayed during approx. 2 s
     Calculating test … the system calculates the test value

Calculating test … Status OK

- The new gross weight is displayed: *0027 kg*. Subsequently, the standard command line is displayed:

```
Keypad
Select item with cursor up / down / left / right Change with + / -
Return to FiXed, Set fullscale, Calibrate by Weight or Millivolts
E Exit calibration
```

Calibration is finished. The data must be saved: Proceed as described in points 9. and 10. of the 'Weighing point calibration procedure'.

5.6.7.2 Subsequent zero correction without weights

Proceed as described in points 1. to 7. of the 'Weighing point calibration procedure'.
This is followed by the actual calibration:

1. The following command line is displayed in the calibration mask *Deadload*

```
Calibration by mV/V
Enter deadload mV/V, Q to quit, S to skip: _
```

Enter deadload mV/V	Enter the deadload in mV/V	
Q to Quit	+ Enter key [↵]	quit the calibration without doing anything
S to Skip	+ Enter key [↵]	skip the tare entry

2. Enter the deadload in mV/V
   - Enter the deadload with comma (or point)
   - Press the Enter key to complete the operation [↵]

   - PR1713 evaluates the data.
     Now, the following command line is displayed in the weighing point calibration mask:
     Setting deadloads … the system saves the data. Subsequently:
     Setting deadloads … Status OK the message is displayed during approx. 2 s

   - The weight display does not change.

3. The following command line is displayed in the calibration mask *Span*

```
Calibration by mV/V
Enter span mV/V, E to exit: _
```

Enter span mV/V	enter the span in mV/V
E to Exit	+ enter key [↵], no entry/ finish calibration

4. Set only the zero = finish the calibration *E to End*
   Press key [E]

   - PR1713 evaluates the data.
     Now, the following command line is displayed in the weighing point calibration mask:
     Calculating test … the system calculates the test value
     Calculating test … Status OK

   - The new gross weight value is displayed: 0027 kg

   Subsequently, the standard command line is displayed:

```
Keypad
Select item with cursor up / down / left / right Change with + / -
Return to FiXed, Set fullscale, Calibrate by Weight or Millivolts
E Exit calibration
```

Calibration is finished. The data must be saved: proceed as described in points 9. and 10. of the 'Weighing point calibration procedure'.

5.6.8 Error messages in the calibration menu

`no standstill`	no standstill was reached during calibration.
`value is invalid`	the parameter is too high or too low. Proposal of the highest permissible value with: **setting max. ...**
`ADU Error`	general error ADC/ load cells
`current load is below deadload`	occurs when entering the SPAN value. The deadload was removed. Subsequently, SPAN is below zero.
`Current load is above full scale`	occurs when entering the SPAN value or the calibration weight value. The input voltage or the input voltage calculated for the f.s.d. is >SKE.
`Illegal stepwidth`	the entered step width is not correct.
`FSD not multiple of stepwidth`	SKE not divisible by stepwidth/ incompatible stepwidth.
`Fullscale is below calibration point`	after calibration, a new f.s.d. was entered again, which, nevertheless, is below the initial calibration point/ f.s.d. Caution: subsequent entry of a **larger** scale is permissible, without recalibration!
`overflow in converting units`	These messages are only generated with different dimensions.
`underflow converting units`	To generate an error message, the scale must be incalculable, e.g. f.s.d. 1000 kg, entered calibration weight 1g (should be 1 t, which would be accepted).
`Input voltage above max`	The actual or the calculated input voltage is > 36 mV
`not enough counts per d`	The measurement signal for the specified scale is too small

`device not ready`
`protocol error`
`BCC error`
	EAROM error
	" "
	" "

`Canceled`	Cancel by pressing key Q

5.7 Additional weighing points

In addition to the weighing point module in PR1713/00 (weighing point A), a weighing point (B) can be defined:

- PR1720/00 via Interbus-S (IBS-UART) **or**
- customer-specific weighing point one, on weighing point B

As PR1713 cannot display the weight value on the front panel, a remote display device for weighing point B may be installed (supported with firmware rel. 1.1).

These additional weighing points are defined in mask *Additional weighing configuration*. This mask is called up from mask Weighingpoint, by pressing key [A].
Moreover, this mask provides a survey of the additional weighing point definition:

Customer-specific weighing point *user*
Not defined *none*

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
   Additional weighingpoint configuration  Mo xx.xxx xxxx 09:31:51

  B :          user



  U Userdefined P PR1720
  O Off E Exit
```

- Weighing point selection
  Select the weighing point using the two cursor keys [↑] and [↓]. The actually selected weighing point is highlighted by inverse display.
- Definition of additional weighing points
  Dependent of selected weighing point, the permitted definitions are displayed. Definition is by entry of the relevant letter. For entry of the required parameters, the relevant mask is displayed subsequently.

  Customer-specific weighing point *U Userdefined*

  Additional external weighing point *P PR1720*

  If the weighing point was already defined, the following prompts may be displayed:

- Deleting a weighing point
  Delete the weighing point *O Off*
  Pressing key [O] deletes a weighing point. The following prompt is displayed:
  Switch WP off? … sure ? Press [Y] or [N]
  Return to the weighing point mask is with *E Exit configuration* .

5.7.1 PR1720 as second WP

The weight is read directly from the PR1720/00. By means of a customized IEC 1131 program, the weight value (read out with GET_WEIGHT) can be made available on the alphanumeric display of PR1713.

- Entry of the configuration parameters is via the following mask.
  The weighing point is indicated in the mask header: *Configuration of WP B*

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Configuration of WP B                Mo xx.xxx xxxx 09:31:51


  T Update Time  :        6*50 msec
  A Input address:        1


  E Exit configuration
  Q Quit configuration

  Enter Input address: [1]. E to exit:2
address must be >=1 and <=4
```

Selection of the individual parameters is by the relevant letter.

- Cycle time for weight display *T Update time*
  Entry is in n * 50 msec.
  With an entry of e.g. 6, the displayed weight values are updated at intervals of 300 msec (= 6 * 50 msec).
  Permitted range: 2 … 20
  Error message with faulty cycle time entry*: Bad number*
- PR1720/00 address at the Interbus-S*: Input address*
  Permitted range: 1 … 4 (according to the position at the remote bus)
- Finish the configuration and save the values *E Exit configuration*
- Leave the configuration without saving the values *Q Quit configuration*
  If parameters were changed, the following prompt is displayed:
  Abandon changes? … sure ? Press [Y] or [N]

5.7.2 Customer-specific weighing point

With a customer-specific weighing point, weight measurement is done by an external weighing point, which is connected via an interface to PR1713. The weight must be provided to the PR1713 batch program on a definable SPM address by a customer-specific IEC 1131 program.

♦ Gravimetric weight measurement
  The weight values can be provided as follows:

  - The weight values are read in.
    The weight values are determined by an external weighing point module (e.g. PR1710), read in by a IEC 1131 program and stored in the relevant SPM address.
  - Reading in and scaling of the measuring signal
    An analog or digital measuring signal, analogous to the weight value, is read in by a IEC 1131 program, converted according to a scale factor and stored in the relevant SPM address.

  The value is available for evaluation by the customer-specific IEC 1131 program. The scale factor can be entered in the configuration mask. Entry is as parameter 'Weight/ pulse' (scale), i.e. weight per count.

♦ Volumetric weight measurement
Conversion into a weight value and weight pulse counting must be programmed in a customized IEC 1131 program.
The specific weight/ pulse (scale) can be entered in the configuration mask, i.e. it is available for evaluation by the customized IEC 1131 program.

♦ General technical data (External) weighing point

- Weight input — configurable
  Memory location — M marker area
  Size — D double word per weighing point
- permitted input address range — %MD32 … %MD255
- Permitted batch modes — as standard weighing point
- Batching cycle — 50 msec
- Power failure behavior
  Batching sequence — provided, as standard
- Save the definition data in the PR1713 RAM. Data must be re-entered after cold starting.

♦ Entry of configuration parameters
Entry is via the following mask.

- Weighing point display

The weighing point is shown in the mask header: *Configuration of WP B*

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Configuration of WP B                Mo xx.xxx xxxx 09:31:51

  F Fullscale    :     1000kg
  S Stepwidth    :        1
  O Overload     :        0d
  M Minwgt       :        0d
  C Scale        :        1kg / 1cnt
  T Update Time  :        6*50 msec
  A Input address:       32


  E Exit configuration
  Q Quit configuration

  Enter Input address: [32]. E to exit:27
address must be >=32 and <=255
```

Select the individual parameters by entry of the relevant letter.

- F.s.d. value: *F Fullscale*
  The full scale value determines the maximum weight to be measured. Permissible entries cover the overall weight range between 0.1 00 and 99999 00 in g, kg, t or lb.
  The value must be divisible by 100 and must have max. 3 digits behind the decimal point. If the entry does not meet these criteria, the following error message is displayed:
  Illegal Fullscale
- Stepwidth (divisions): *S Stepwidth*
  Stepwidths: 1, 2, 5, 10, 20, 50. With all other entries, the following error message is displayed *Illegal Stepwidth*

- Maximum permissible overload: *O Overload*
  Entry in d, permissible range 0 d to 9999999 d
- Min. weight limit for print-out: *M Minwgt*
  Entry in d, permissible range 0 d to 9999999 d
- Weight value/ pulse: *C Scale*
  Entry is in two steps:

  1. Entry of weight value per pulse(s)

  Enter weight: [1kg] , E to Exit:
  Old value/ default setting is displayed in square brackets: *[1kg]*
  Cancel the entry: [E]+ Enter key [↵] *E to Exit*
  Error message with faulty weight entry: *Bad weight*
  Units (scale/ fullscale) do not match: *Unit does not match*
  Permitted weight entries: 7 digits with decimal point
  The entry must be completed with the correct unit (e.g. kg).
  The units of fullscale and scale must be equal.
  Checking is done when leaving this mask.
  See below E Exit configuration.
  If the entry is accepted, a prompt for entry of the number of pulses is displayed.

  2. Entry of the number of pulses

  Enter counts: [1] , E to Exit:
  The old value/ default setting is displayed in square brackets: *[1]*
  Cancel the entry: [E]+ Enter key [↵] *E to Exit*
  Error message after faulty entry of the number of pulses: *Bad number*
- Cycle time for weight display *T Update time*
  Entry is in n * 50 msec.
  With an entry of e.g. 6, display of the weight values is updated at intervals of 300 msec (= 6 * 50 msec).
  Permitted range: 2 … 20
  Error message with faulty cycle time entry*: Bad number*
- Finish configuration and save values *E Exit configuration*
  If different weight values for fullscale and scale were entered, the following error message is displayed:
  Fullscale and Scale must have same unit
  The error must be corrected. Subsequently, the mask can be left.
- Leave the configuration without changing values *Q Quit configuration*
  If parameters were changed, the following prompt is displayed:
  Abandon changes? … sure ? Press [Y] or [N]

5.8 Sub-menu *Service*

Mask *Service* is called up from the *Main-Command-Level* by pressing key [S].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Service                              Mo xx.xxx xxxx 09:31:51

  H Show hardware configuration
  M Show available memory
  T Test Inputs/Outputs
  F Show last fault

  P Print all configuration data
  E Exit
```

The following menu items are called up by pressing the relevant keys:

- Display of hardware configuration — *H Show hardware configuration*
- Display of available memory — *M Show available memory*
- Test of input and output modules — *T Test Inputs/Outputs*
- Hex-Dump of the last "fatal system error" — *F Show last fault*

⇒ If a production in PR1713 is busy, the module test (T) is disabled:

Production is active, testmode is not possible
Hit any key to continue
Press any key to remove this message.

- Print out all configuration data. — *P Print all configuration data*
- Leave sub-menu Service — *E Exit*

As no data can be changed, return is direct to the main menu without additional prompts.

5.8.1 Available memory in PR1713

Calling up mask *Show available memory* is from sub-menu *Service* by pressing key [M].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Service                              Mo xx.xxx xxxx 09:31:51

MEMORY STATISTICS

   123648 bytes maximum memory available
    17312 bytes memory in use
   106336 bytes free memory
        1 blocks
   106336 bytes in largest block
     1196 free memory handles
   262144 Physical Memory Bank 1
        0 Physical Memory Bank 2

Hit any key to continue
```

The following information is displayed in the mask

- Max. free memory capacity [bytes] *bytes maximum memory available*
- Used memory capacity [bytes] *bytes memory in use*
- Free memory capacity [bytes] *bytes free memory*
- Number of available blocks *blocks*
- Largest available block [bytes] *bytes in largest block*

Hit any key to continue to leave the mask.

5.8.2 Show hardware configuration

Calling up mask *Show hardware configuration* is done from sub-menu *Service* by pressing [H] Hardware

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Service                              Mo xx.xxx xxxx 09:31:51

I/O-Slot 1 : PR1713/04 Serial Interface RS232 and RS485
I/O-Slot 2 : PR1713/06 Analog Out
I/O-Slot 3 : PR1713/12 Digital I/O
I/O-Slot 4 : PR1721/01 Profibus-Interface

Hit any key to continue
```

- The modules identified by the PR1713 system software are displayed.
- With modules containing firmware, the module software version is also displayed.
- Hit any key to continue

5.8.3 Testing the input and output modules

- During module testing (T), no outputs are set by the PLC programs, i.e. the PLC programs continue running, the inputs are read, but the output commands are not transmitted to the process.

Calling up mask *Test Inputs/Outputs* is from sub-menu *Service* by pressing key [T].

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Test Inputs/Outputs                  Mo xx.xxx xxxx 09:31:51

1  I/O-Slot 1 : PR1713/04 Serial Interface RS232 and RS485
2  I/O-Slot 2 : PR1713/06 Analog Out
3  I/O-Slot 3 : PR1713/12 Digital I/O
4  I/O-Slot 4 : PR1721/01 Profibus-Interface

E Exit
```

The modules on sockets 1 to 4 identified by the PR1713 system software are displayed.

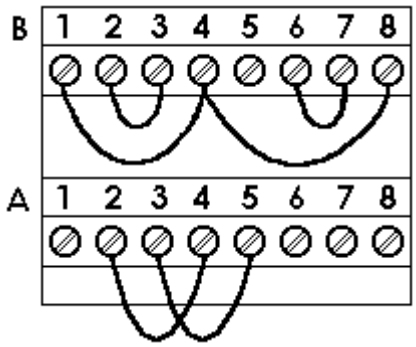
- Select and test module
  The mask corresponding to the module type is displayed by entry of the socket number 1…4. Description of the module-specific tests is in the following sub-sections.
- Leave sub-menu 'Test Input/Output' *E Exit*

⇒ After leaving this mask (E), return is to sub-menu 'Service'. Only then all outputs set during testing are reset and the output commands of the PLC programs are retransmitted to the process.

5.8.3.1 PR1713/04 serial I/O module testing

At the PR1713 hardware test level, PR1713/04 serial interface cards can also be tested, provided that the following jumpers are fitted in the module terminal blocks:

Terminal strip B rear (top) row	RS 232	B1 DCD	B2 RXD	B3 TXD	B4 DTR	B5 Sign. GND	B6 RTS	B7 CTS	B8 RI
Switch on the card, S101:	1:On 2:Off 3:On 4:On 5:On								
Terminal row A front (bottom) row	RS485/422 Switch ON acc. to table	A1 Sign. GND	A2 TxB	A3 TxA	A4 RxB	A5 RxA	A6 nc	A7 nc	A8 nc



The interfaces are given logic names in the order of allocation found in the slots. In this example, the only card is always detected as TTY1 and TTY2, whereby TTY1 is the RS 485 and TTY is the RS 232 interface. If 2 or 3 PR1713/04 cards are fitted, logic names from TTY3 do also exist (starting with slot 1).

Output in case of success:

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Test PR1713/04 Slot-Number 1          Mo xx.xxx xxxx 09:31:51

   TTY1:
        Send with RTS ON : passed
        Send with RTS OFF: passed (nodata)
        Send with RTS ON : passed

   TTY2:
        TxD-RxD    : passed
        RTS-CTS    : passed
        DTR-DCD/RI : passed
```

Output in case of error (e.g.):

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Test PR1713/04 Slot-Number 1          Mo xx.xxx xxxx 09:31:51

   TTY1:
        Send with RTS ON : failed (nodata)
        Send with RTS OFF: passed (nodata)
        Send with RTS ON : failed (nodata)

   TTY2:
        TxD-RxD    : failed (nodata)
        RTS-CTS    : pattern failed (1111 0010)
        DTR-DCD/RI : pattern failed (1111 1100)
```

5.8.3.2 Analog output module testing

The test can be executed for PR1713/06 and PR1713/07.

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Test PR1713/06  Slot-Number 2         Mo xx.xxx xxxx 09:31:51

   Current Analog Output Value:  Dec: 075%   Hex: BFF
Enter decimal output 0..100%: _
   Set Output:
   D Decimal-Input-Format 0..100% for Output-Value
   H Hexadecimal-Input-Format for Output-Value

   E Exit
```

- Display of the socket number is in mask header:
  Test PR1713/06 Slot-Number 2
- Enter the analog output value
  Entry of the analog output value is possible in various formats. Selection is by entry of the relevant letter.
  - decimal entry 0…100% *D Decimal-Input-Format 0…100% for Output-Value*
  - hexadecimal entry *H Hexadecimal-Input-Format for Output-Value*

  The dialog line for decimal input is displayed as an example.
- Display of the actual analog output value is in the two formats. See line: *Current Analog Output Value*
  - decimal *Dec: 075%*
  - hexadecimal *Hex: BFF*
- Leave mask 'Test PR1713/06' with *E Exit*

⇒ After leaving this mask (E), return is to the sub-menu
Test Inputs/Outputs: The entered output values remain set, until returning to menu *Service*.

With PR1713/07 additionally the analog-inputs are displayed similar to

```
   Analog Input 1 = 3072 = 75% = 3,75V Hex: BFF
   ....  ....
   Analog Input 4 = 3072 = 75% = 3,75V Hex: BFF
```

5.8.3.3 Digital module testing

The test can be executed for PR1713/12 and PR1713/15.

```
PR1713/00 Rel. xx.xx.x xx.xx.xxxx xx:xx
     Test PR1713/12  Slot-Number 3         Mo xx.xxx xxxx 09:31:51

   Inputs: I1= 1  I2= 0  I3= 1  I4=  1
   Outputs: Dec: 11     Hex: 0B    Bin:  1011
Enter Bit-Number for Reset: 11
   Set Outputs:
   D Decimal-Input-Format for Output-Value
   H Hexadecimal-Input-Format for Output-Value
   S Set Bit   Bit-Nr. 0..11
   R Reset Bit Bit-Nr. 0..11

   E Exit
```

♦ Display of socket number
The socket number is displayed in the mask header: *Test PR1713_12 Slot-Number 3*

♦ Display of the actual digital input values (4)
The actual values are displayed in line: Inputs:
I1= 1 I2= 0 I3= 1 I4= 1

♦ Entry of output values (4)
Entry of the output values for the 4 outputs is possible in various formats. Selection is by entry of the relevant letter.
Set all outputs simultaneously:
- Decimal input format *D Decimal-Input-Format for Output-Value*
- Hexadecimal entry *H Hexadecimal-Input-Format for Output-Value*

Setting/ resetting individual outputs:
- Set a bit, bit no. 0…23 *S Set Bit Bit-Nr. 0 … 23*
- Reset a bit, bit no. 0…23 *R Reset Bit Bit-Nr. 0 … 23*

The dialogue line for resetting a bit is shown as an example: *Enter Bit-Number for Reset: 11*

♦ Display of the analog output values
Display is in three formats. See the following mask line: *Outputs:*
- Decimal *Dec: 2048*
- Hexadecimal *Hex: 800*
- Binary (bit 23 left, bit 0 extreme right) *Bin: 10000000 00000000*

♦ Leave mask 'Test PR1713/12' with *E Exit*

After leaving this mask (E), return is to the sub-menu. *Test Inputs/Outputs:*
The entered output values remain set until returning to menu 'Service'.

5.8.3.4 Test BCD-Output

The screen for testing PR1713/08 is displayed, if the card is detected in the system. The actual input- and output values are displayed binary and for the output also in hex- and decimal notation. Single output bits may be changed by 'Set Bit' or 'Reset Bit'. You may enter output data in hex- or decimal format. By means of 'Control: X1Y0' the output is controlled by the input Enab.

5.8.3.5 Test DIOS Card

The screen for testing PR1713/13 is displayed, if the card is detected in the system. The fields 'Ready' and 'Run' must be active. Changes of the inputs at the remote bus are displayed. By means of 'Modify bytes' outputs at the remote bus can be changed. The fields "BSA, CTR, RB, LB, MOD" are not in use, they are intended for future extensions.

```
       Test PR1713/13 Slot-Number 3

   Diag Bits=A0: Ready Fail Run BSA CTR RB LB MOD

   %IB 3.x  =000100A001000000 IBS Status
   %IB 3.1.x=0000              %QB 3.1.x=0000

 E Exit       Return  Modify bytes
```

5.8.3.6 Test Fieldbuscard

The screen for testing PR1721/.. is displayed, if the card is detected in the system. Depending of the type of the card a fitting headline is generated, additionally the inut- and outputstring is displayed, e.g. for PR1721/04:

```
       Test PR1721
   PR1721 Devicenet Slave
   Indata  0000000000000000
   Outdata 0000000000000000
 E Exit
```

5.8.4 Printing all configuration data

Calling up is done by pressing key [P]:

- Print out all configuration data: *P Print all configuration data*

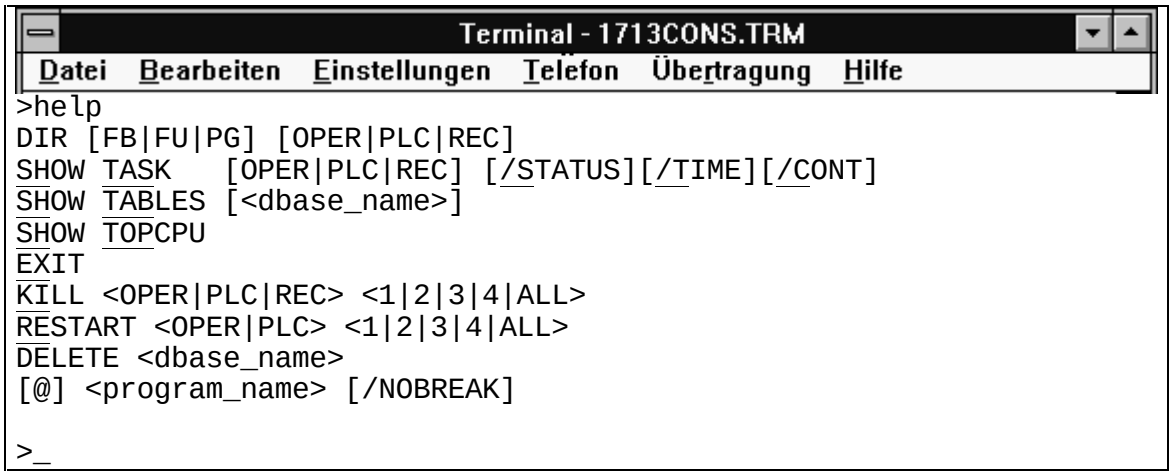
Printing out is done via the serial interface configured for the printer.

5.9 PROLOC operating level

The operating level is required for testing (user-specific) IEC 1131 programs.
Calling up PROLOC operating level Proloc is from the Main-Command-Level by pressing key [P].

- An empty screen with prompt character '>' is displayed.
  The cursor is positioned beside this character.
  The operating level expects the entry of a command.
- By entry of command *Help* (complete by pressing the Enter key [↵]), a short-form description of possible commands is displayed.

Subsequently, the system waits again for entry of a command:



Leaving the PROLOC operating level

- By entry of command *Exit* (complete by pressing the Enter key [↵]), return is to the Main-Command-Level.

6 TECHNICAL DATA

The characteristic data are valid after a min. warm-up time of 60 minutes (reference temperature 23 °C). Values specified without tolerances are average values and are only used for information.

6.1 Analog part, A/D conversion

Principle	DC. voltage, integrating A/D converter, ratiometric to the load cell supply voltage
Conversion time	50 ms (down to 10 ms in preparation)
Measuring time	50 ms, 100 ms and multiples up to 2 s
Analog filter	active Butterworth low-pass 40 dB/ decade, limiting frequency 2 Hz
Digital filter	active 4th order Bessel filter or aperiod. limiting frequency adjustable within 0,1 Hz and 5 Hz

6.1.1 Accuracy and stability

Accuracy class (III)	$\leq$ 5000 d according to OIML R76 (EEC-approval D99-09-039)
Min. meas. signal (W&M)	0,5 mV/V or $\geq$ 6 mV for 5000 d 0,3 mV/V or $\geq$ 3.6 mV for 3000 d
Linearity error	< 0.007 %
Zero stability error	TK_0 < 0.1 µV/K RTI
SPAN stability error	TK_{Spn} < +/- 6 ppm/K

6.1.2 Sensitivity

Sensitivity	(at 11,2 cnt/d)	1,2 µV/d for 5000d W&M OIML R76
		1,0 µV/d for 3000d W&M multi range scale
	(at 4 cnt/d)	0,42 µV/d, not for W&M
	(at 1 cnt/d)	0,11 µV/d, not for W&M, internal sensitivity
Resolution internal		>330000 steps with 36 mV
Min. meas. Signal		>0,03 mV/V for 3000 steps internal, not for W&M
Input voltage (meas.-signal + deadload)		0 ... max. 36 mV =
Deadload range		36 mV - (max. meas. signal); entry/ calibration via software

6.1.3 Load cells

Load cell connection	all strain gauge cells, 6 or 4-wire connection possible.	
Load cell supply	U= ± 6 V for I_{max}= 160 mA	
Load cell supply circuit	12V DC	for max. 8 load cells each with 600 Ω for 4 load cells each with 350 Ω
Max. load	≥ 75 Ω	

6.1.4 Safe condition

The software is monitored by a watchdog timer. In case of error, reset occurs, whereby all digital and analog outputs are reset to a defined condition. The load cell input is checked, if the error leads to a measurement value which does not make sense. No failure checking of digital inputs and outputs or of analog output is made.

6.1.5 Certificate of type approval

For the System Weighing Controller PR1713, certificate of type approval no. D99-09-039 by Physikalische-Technische Bundesanstalt (PTB) for non-automatic weighing machines (EN45501) is available, i. e. the indicator meets the prerequisites for approval by the local authorities in all countries of the European community.

For weights & measures application the W&M mode have to be Enabled, see 4.4.3

PTB

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

EG-Bauartzulassung

EC type-approval certificate

Zulassungsinhaber: *Issued to:*	GWT GLOBAL Weighing Technologies GmbH Meiendorfer Str. 205 22145 Hamburg Bundesrepublik Deutschland
Rechtsbezug: *In accordance with:*	§ 13 des Gesetzes über das Meß- und Eichwesen *(verification act)* vom*/dated* 23. März 1992 (BGBl. I S. 711) in Verbindung mit Richtlinie *(in connection with council directive)* 90/384/EWG, geändert durch *(amended by)* 93/68/EWG
Bauart: *In respect of:*	**Nichtselbsttätige elektromechanische Waage mit oder ohne Hebelwerk** ***Nonautomatic electromechanical weighing instrument with or without leverworks*** Max 1 kg ... 500 t (III) n ≤ 5000 Type *Type*: PR1713
Zulassungsnummer: *Approval number:*	D99-09-039
Gültig bis: *Valid until:*	11.11.2009
Anzahl der Seiten: *Number of pages:*	7
Geschäftszeichen: *Reference No.:*	1.14 - 99052555
Benannte Stelle: *Notified Body:*	0102

Im Auftrag
By order

Link

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 40

Braunschweig, 12.11.1999

Siegel
Seal

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der EG-Bauartzulassung ist. Hinweise und eine Rechtsbehelfsbelehrung befinden sich auf der ersten Seite der Anlage

The principal characteristics, approval conditions and special conditions, if any, are set out in the Annex which forms an integral part of the EC type-approval certificate. For notes and information on legal remedies, see first page of the Annex.

6.1.6 Location of seals

Physikalisch-Technische Bundesanstalt

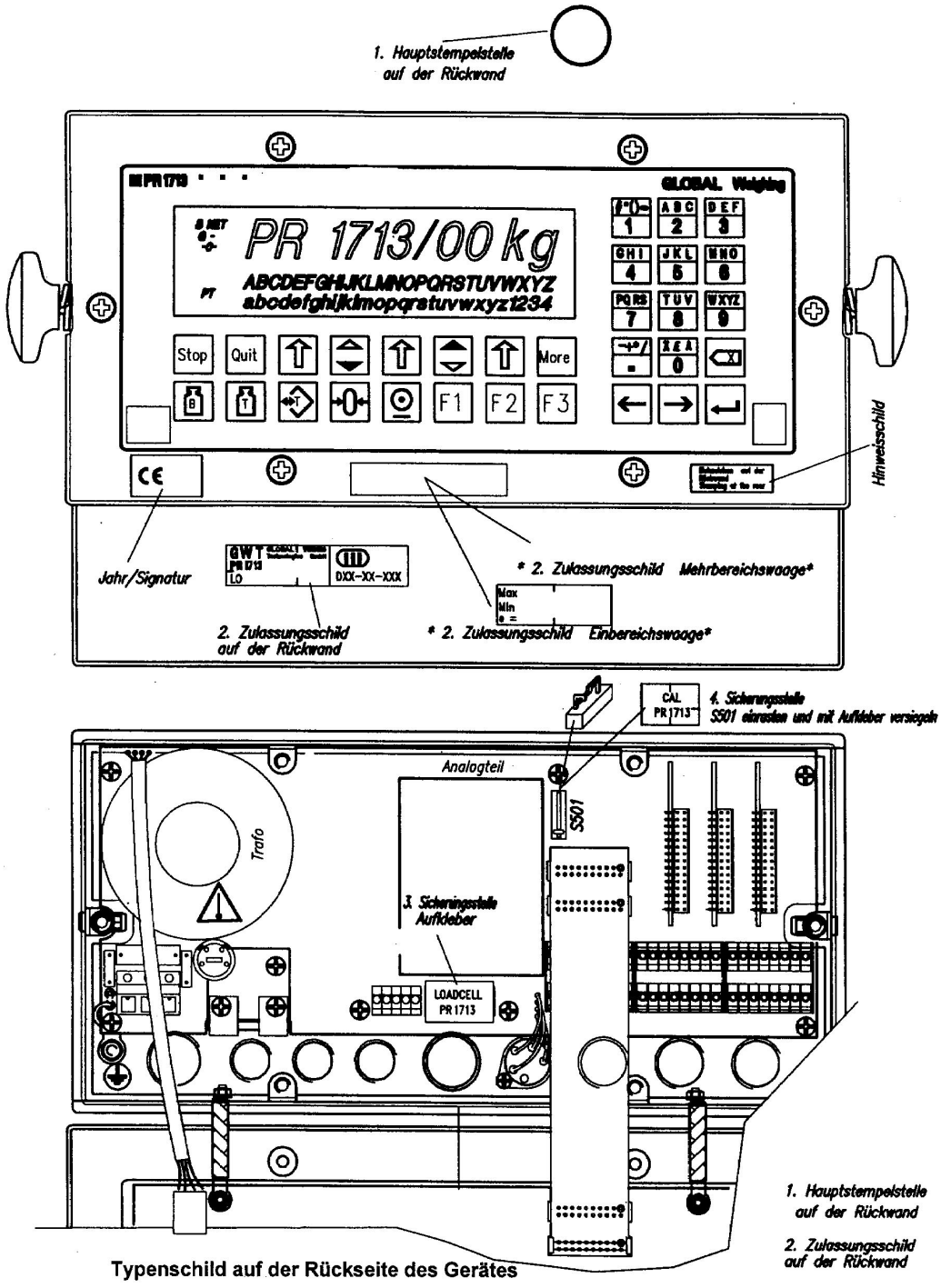
Anlage zur EG-Bauartzulassung

Annex to EC type-approval certificate

vom 12.11.1999, Zulassungsnummer: D99-09-039 Seite 7 von 7 Seiten

dated 12.11.1999, Approval number: D99-09-039 *Page 7 of 7 pages*

Bild 1



Typenschild auf der Rückseite des Gerätes

In order to facilitate weights & measures approval by the local authorities, labels and seals, which can be fitted on the indicators shown in the example above are enclosed in a plastic bag in the cover of this manual. We recommend using a fibre-tipped pen with water and ultraviolet light resistant ink, e. g. type Staedtler PANCOLOR EAM 4007817-32116. for the inscription on the labels. If necessary, this pen is available under service code no. 5312 310 18045 from your local G W T sales or service organization.

6.2 Digital part

Processor:	MC68331 with 16 MHz
SRAM:	2x 128k8 (max. 2x 512k8) in SMD
	Optional: PR1713/05 2x 512k8 for plugging into DIP
FLASH:	2x 512k8
EEPROM:	2k8 SPI

6.2.1 Display

Green vacuum-fluorescent display with serially connected data interface.

Weight display	(top)	7 large digits for weight, dimension and status
Dialogue display	(below)	2 rows each with 20 characters (dot matrix) for text.

6.2.2 Keyboard

For the entry, the front panel is provided with a foil-covered alphanumeric keyboard with 31 keys.
Dimensions: 103 x 247 mm

6.2.3 External keyboard

External PC-AT keyboard, max. 50 mA current consumption (no additional units are possible!). The standard socket for the keyboard is protected by a multi-fuse element.

6.2.4 Built-in RS 232 interface

Terminal block; functions: calibration, configuration, operation, communication

Mode	RS 232, XON/XOFF, ANSI, various protocols
Baudrate	300 - 19200 Bd
Data bits	7/ 8 Bit
Parity	none, odd, even

6.2.5 Power supply PR1713/00

Power voltage	115 V/ 230 V AC	+10% / -15%	48-62 Hz
Power consumption	14,5 W/ 19 VA		

6.3 Environmental effects

6.3.1 Power voltage sags

Power voltage sags	>10 ms at 100% sag, without instrument reaction >20 ms at 50% sag, " " " "

6.3.2 Environmental conditions

Temperature range	
Ambient temperature operation	-10... +40 °C
Switch-on temperature	0... +40 °C
Storage/ transport	-40... +70 °C
Humidity	< 95 %, without condensation, (acc. to IEC 68-2)
Protection type	IP65
Vibration	to IEC 68-2-6, test Fc

6.3.3 Electromagnetic immunity

Electrostatic discharge	min. IEC1000-4-2, level 3
Interference (supply and data cables)	min. IEC1000-4-4, level 2
Electromagnetic fields	min. IEC1000-4-3, level 2

6.3.4 RF interference suppression

Electromagnetic emission	acc. to EN55011 group 1, limit value class B

6.3.5 CE conformity marking

PR 1713/00 is **CE** approved according to EMVG with the following text:

The product PR1713/00 for non-automatic weighing systems complies with the following European guidelines:

Number:	89/336/EEC as amended by 91/263/EEC, 92/31/EEC and 93/68/EEC
Text:	Council guideline for harmonizing the legal regulations of the member states on electromagnetic compatibility.

6.4 Mechanical data

6.4.1 Construction type

All metal housing of stainless steel. Protection class IP 65.

6.4.2 Dimensions

Housing	Dimensions
Width	288 mm
Height	144 mm
Depth	130 mm (135 mm incl. blind plugs)

6.4.3 Connections

Via PG glands. Plug-in screw terminals in the unit.

6.4.4 Accessories

Installation manual, operating manual, label for weighing range
2 cable ties, screw driver, metal PG glands:

EMC-glands	2x PG 13,5
	1x PG 9

6.4.5 Weight

Net weight	3,5 kg
Shipping weight	5 kg

6.5 Options

6.5.1 Analog output

16 bit resolution, galvanically isolated

Output	Gross, net weight or fixed value, updating coupled with the measuring time
Range	0/4 mA ... 20 mA
Load	0 ... 500 Ω
Resolution	16 bits
Linearity error (23°C)	<0.012 %
Overall error	<0.15 %
Overall temperature error	<50 ppm/K

6.5.2 Digital inputs

4 Inputs, galvanically isolated via opto-coupler (passive mode, external supply, no common potential).

Input signal for 'Low'	0 ... 5 V or open input
Input signal for 'High' (active status)	10 ... 31 V
Input current for 'High'	< 8 mA at 24 V, < 4 mA at 12 V
Min. control time	> 100 msec

6.5.3 Digital outputs

4 outputs, galvanically isolated, for **PR1713/12** via opto-coupler (NPN transistors, open collector), for **PR1713/15** via relais contacts.

permissable output load with:	PR1713/12	PR1713/15
Max. contact voltage	32 V	32 V
Max. contact current	25 mA	1 A
Voltage drop at 25 mA	3 V (typical)	-

6.5.4 Serial interfaces

Up to 3 optional interface modules PR1713/04

Mode	RS 232 and RS 485 on the interface module
Baudrate	300 ... 19200 Bd
Data bits	7/ 8 bits
Parity	none, even, uneven, '0' or '1'
Protocols	EW bus, remote indicator, printer, XON, RTS

6.6 Field buses

6.6.1 Interbus-S/ Profibus-DP/ DeviceNet

INTERBUS	Standard	DIN 19258 INTERBUS
	Baudrates [kBps]	500 [kBps]
	Knode width	8 bytes or 4 words
	Process data	yes
	Parameter data	no
	ID	03 ⇔ remote digital bus unit with I/O
PROFIBUS	Standard	EN 50 179 volume 2, PROFIBUS DIN 19245: PROFIBUS, Process Field Bus (part 1 and 3)
	Baudrates [kBps]	9.6, 19.2, 93.75, 187.5, 500, 1500, automatic detection
	Buffer size	8 bytes
	I/O data	8 bytes per
	UserPrm	No
	Sync	YES
	Freeze	YES
	Clear	YES
	Set-Slave-Add	No
DeviceNet	Standard	Specification DeviceNet Volume 1 Release 1.3 and Volume 2 Release 1.2 from 4.3.1996
	Baudrates [kBps]	125, 250, 500
	Common Services	Get_Attribute_Single, Set_Attribute_Single, Reset

6.6.2 GSD file for PR1721 Profibus DP

Use our website at Internet address **http://www.global-weighing.com** for loading the GSD file GWT_00C3.GSD for PR 1721, or generate file GWT_00C3.GSD by entry of the following listing (the comments behind the semi-colon are optional):

```
;
;===========================================================================
;GSD file for the Profibus interface PR1721/01
;Status 12.03.1998
;===========================================================================
;
#Profibus_DP
Vendor_Name = "GWT Global weighing technologies"
Model_Name = "Profibus Interface"
Revision = "Version 1.0"
Ident_Number = 0x00C3
Protocol_Ident = 0         ;only DP instrument
Station_Type = 0           ;compact station
FMS_supp = 0               ;FMS is not supported
Hardware_Release = "1.0"
Software_Release = "1.0"
;
9.6_supp = 1               ;supported Baudrates
19.2_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
;
MaxTsdr_9.6 = 60     ;max. reply times with the different Baudrates
MaxTsdr_19.2 = 60
MaxTsdr_93.75 = 60
MaxTsdr_187.5 = 60
MaxTsdr_500 = 100
MaxTsdr_1.5M = 150
Redundancy = 0       ;no redundant transmission
Repeater_Ctrl_Sig = 0;no RTS signal
24V_Pins = 0         ;no 24V for connection of a maintenance unit
Freeze_Mode_supp = 1 ;Freeze mode is supported
Sync_Mode_supp = 1   ;Sync mode is supported
Auto_Baud_supp = 1
Set_Slave_Add_supp = 0
User_Prm_Data_Len = 0
Min_Slave_Intervall = 50   ; 50x100uS->5ms. min. Slave intervall
Modular_Station = 0
Module = "8 Byte Out, 8 Byte In" 0xA7, 0x97
EndModule
```

6.6.3 EDS-file for PR1721 DeviceNet

EDS file pr1713.eds can be generated by entry of this listing or copied under Internet address **http://www.global-weighing.com**

```
$ DeviceNet Manager Generated Electronic Data Sheet
[File]
      DescText = "PR1713";
      CreateDate = 11-24-99;
      CreateTime = 11:28:26;
      ModDate = 11-24-99;
      ModTime    = 11:28:26;
      Revision = 1.0;

[Device]
      VendCode = 560;                                    $ Vendor Code
      ProdType = 100;                                    $ Product Type Generic
      ProdCode = 1713;                                   $ Product Code
      MajRev = 1;                                        $ Major Rev
      MinRev = 1;                                        $ Minor Rev
      VendName = "GWT GLOBAL Weighing Technologies GmbH";
      ProdTypeStr = "Weigh Scale";
      ProdName    = "System Weighing Controller";
      Catalog = "PR1713";

[IO_Info]
      Default = 0X0001;
      PollInfo =
      0X0001,
      1,
      1;
      Input1 =
      8,                                                 $ Up to 8 bytes
      0,                                                 $ All bits significant
      0x0001,                                            $ Poll only connection
      "Input Data",
      0,
      "0",
      "The Slot 4 input data";                           $ Help string
      Output1 =
      8,
      0,
      0x0001,                                            $ Poll only connection
      "Output Data",
      0,
      "0",
      "The Slot 4 output data";

[ParamClass]
      MaxInst=0;
      Descriptor=0;
      CfgAssembly=0;

[Params]

[EnumPar]

[Groups]
```

7 ANNEX

7.1 PR1713 /00 Spare parts

Description	Service code number
MAIN PRINTED CIRCUIT BOARD (POWER SUPPLY / ANALOGUE PART / I/O SLOTS)	5312 216 98338
DISPLAY PRINTED CIRCUIT BOARD (MICRO PROCESSOR PART) PLEASE OBSERVE BOARD NUMBER / LICENCE	5312 216 98339
FRONT FOIL KEYBOARD	5312 456 90450
DISPLAY TUBE CX 050 (for GWT)	5312 131 98011
DISPLAY FILTER SCREEN / GREEN	5312 480 38012
BATTERY LITHIUM 3V CR2354 (ON MICRO PROCESSOR BOARD)	5312 138 18012
FUSE 250 MA T / LOADCELL (RIGHT SIDE TRANSFORMER)	5312 253 28005
CABLE ENTRY GLAND PG 9	5312 505 48013
CABLE ENTRY GLAND PG 13.5	5312 505 48014
CABLE ENTRY GLAND PG 12	5312 505 48015
CONNECTOR, 7 POL / LOADCELL	5312 264 48007
CONNECTOR , 5 POL BUILT-IN SER I/O	5312 264 48008
CONNECTOR , 8 POL - OPTION SLOTS	5312 264 48009
SCREW FOR FRONTPLATE	on request
GASKIT FOR FRONTPLATE	on request

7.2 Other PR1713 documents

Operating manual	Release 1.x	9499-050-42910
System manual (*general*):	in preparation	9499-054-43110
Batching manual	in preparation	9499-057-43210

7.3 Glossary

The following terminology is used in this document:

ADU	Analog digital unit/ converter
CAL	Single in line switch in the instrument (3.2) for data protection
Coldstart	All programs and tables loaded in the memory are deleted
DDE	Microsoft communication protocol
EW protocol	The serial communication protocol for Global Weighing batching systems, version V1/ V2/ V3
Flash	Program loading (also parts)
FSD	Full scale deflection
GND	Ground, common (earth) potential
InBatch	Batch Control System of the Wonderware company
Interbus-S	A standard communication protocol
ISA S88.01	ISA standard related to Batch Control
Profibus DP	A standard communication protocol
Recipe	Recipe (see ISA S88)
SPM	Memory area (Scratch Pad Memory) of PLC
Warmstart	Initialization, all data remain unchanged

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7.5 Hint for customer feedback

Dear customer,

We hope that this product meets your requirements. However, your comments and wishes for improvements are always welcome.

Moreover, information on your application would be greatly appreciated.

For this purpose, please, send your comments to:

GWT GLOBAL Weighing Technologies GmbH
Abteilung Marketing

Meiendorferstrasse 205
22145 Hamburg

FAX: 040-67960 608

Our Internet address is: http://www.global-weighing.com

PR1713 Problemreport

Error description

_____
_____
_____
_____
_____
_____
_____

Software:

Firmware-Version : Rel ___.___.__ Rev ___.___._____ (e.g. Rel 1.02.3 Rev 31.12.1999)
Bios-Version : Rel ___.___.__ Rev ___.___._____
Application SW *) : _____
PR1740 *) : _____
PR1750 *) : _____
PR1791 *) : _____

Hardware

			RS232	RS485
Slot1	PR17_____/_____	Use/Protocol*)	_____	_____
Slot2	PR17_____/_____	Use/Protocol*)	_____	_____
Slot3	PR17_____/_____	Use/Protocol*)	_____	_____
Slot4	PR17_____/_____	FB-Protocol	_____	

Error Messages on Display

_____
_____

Registers (if given):

PC : _____ SR : _____ FMT : _____ ADR : _____
D0 : _____ D1 : _____ D2 : _____ D3 : _____
D4 : _____ D5 : _____ D6 : _____ D7 : _____
A0 : _____ A1 : _____ A2 : _____ A3 : _____
A4 : _____ A5 : _____ A6 : _____ A7 : _____

*) If applicable